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Villages Before Aggregation: The Merrigan Site (LA 110971), a Developmental Period Hamlet, El Rancho, New Mexico

Winifred Creamer
Jonathan Haas

June 30, 2003
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Villages Before Aggregation: The Merrigan Site (LA 110971), a Developmental Period Hamlet, El Rancho, New Mexico

Winifred Creamer and Jonathan Haas

I. The Merrigan Site

The Merrigan site is one of many thousands of small sites scattered across northern New Mexico. These hamlets, occupied by one or a very few families, were the building block of ancient society in this region. The earliest houses found in northern New Mexico, around A.D. 500, were circular pit houses about 1 meter deep. Around A.D. 1000 rectangular, aboveground rooms were added to these, first as storage rooms and then as living rooms. The Merrigan site includes both circular and rectangular rooms, which suggests that the transition from one type of room to the other was still under way when the site was occupied.

The site was first identified during an archaeological survey of property, which was about to be subdivided (Legare 1995, 1996). The buyer of the property, Mr. Tom Merrigan, planned to build a house in a location that would disturb the archaeological materials. Construction could not begin until the site was excavated, and Mr. Merrigan invited the Northern Illinois University archaeological field school to conduct the excavations, as a cost-effective way to carry out the work.

It was the surface ceramics on the Merrigan site that made it of interest as a research project, part of a series of studies carried out by the Northern Rio Grande Research Project (NRGRP). (This project, a collaboration between the Field Museum and Northern Illinois University, has focused on the development of large protohistoric pueblo villages and the impact of European exploration on Pueblo life.) Ceramic types recorded by the first survey included St. Johns Black-on-red, Wiyo Black-on-white, Galisteo Black-on-white, glaze-on-red (type uncertain), and Biscuit A. These materials suggested the site's occupation was transitional between the Late Coalition and Early Classic periods of the regional chronology, approximately A.D. 1300–1360. During this period of time, the first very large pueblo villages were being built, and examination of a small site was expected to yield information about the change from family-sized hamlets to villages with hundreds of residents. Although the ceramics on the surface suggested a fourteenth century date, our excavations determined that the ceramics recorded on the surface were not typical of the site as a whole, which appears to have been in use during the late eleventh century and early twelfth century. The earlier date is supported by the size of the site and the types of rooms. Rather than focus on the aggregation of small groups into larger ones, we excavated the site to look at the transition from pit houses to mostly aboveground rectangular rooms, the traditional "pueblo" of the American Southwest. Hamlets like the Merrigan site have been excavated, some as early as the 1950s (Vytlacil and Brody 1958) and some quite recently. Publications focusing on such excavations are relatively few in number, however, and the present report adds to what we know of the population of northern New Mexico during this period, when society was developing a distinctive regional character.

The bulk of the Merrigan site, or LA 110971, was excavated in 1997 by students from a Northern Illinois University archaeological field school (Fig. 1). Funding for this research came from Mr. Merrigan, the landowner at the time, the Field Museum, the Northern Illinois University anthropology department, the College of Liberal Arts and Sciences External Programs division of Northern Illinois University, and private donations. Project staff is listed in Appendix 1. Although the intent of the research was to lift a nondisturbance easement and allow a house to be

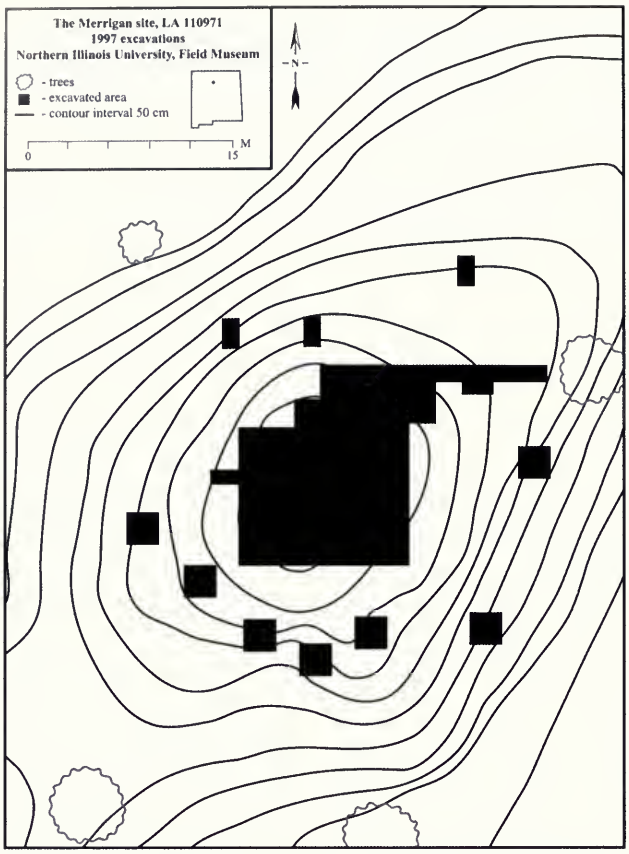

FIG. 1. Topographic map of LA 110971, the Merrigan site.

built on the property by Mr. Merrigan, the parcel was not developed after the easement was removed. The land was sold to the state of New Mexico in 2000 and is now managed as undeveloped state land.

Architecturally, the Merrigan site consists of three circular living rooms and four rectangular storage rooms located on a rise overlooking the Pojoaque River. The rooms were aligned from northeast to southwest, with circular rooms located on the south and the rectangular rooms wrapped in an L-shape around them to the north. There was a hearth in each of the circular rooms as well as outdoor hearths of two sizes. Various pit features and post holes were present both within and outside the structures, some of which supported a *ramada,* or roofed work area (Fig. 2).

First identified on September 23, 1995, during a survey by DSS Consulting (Legare 1995), the Merrigan site was tested in 1996 to ascertain the size of the site and the extent of cultural deposits (Legare 1996). During that work, all visible surface materials were recorded and limited subsurface testing was conducted. The site was estimated to be approximately 1,000 square meters in size, with cultural materials that included ceramics and lithics, ground stone, burned adobe, and fire-cracked rock.

During the initial phase of fieldwork, a concerted effort was made to establish the age of the site using surface ceramics. It could be the case that the site dated to the later Coalition–Classic transition period as identified by Legare if the surface assemblage had been depleted by repeated scavenging of decorated sherds. In that case, we would have expected to find decorated sherds in the subsurface deposits. We might also have found tiny decorated sherds on the surface. Decorated sherds are recognizable at a much smaller size than undecorated sherds, yet the smallest pieces are not particularly attractive to collectors. Neither subsurface nor surface deposits yielded glaze-paint-decorated or Biscuit ware sherds in a consistent pattern. A single glaze ware sherd was

found by a project participant on the surface, just east of the driveway into the property. This find is consistent with the interpretation of the Biscuit ware sherds recorded by Legare as later additions to the site.

A disturbed area of soil that could have been a heavily eroded adobe structure, located east of the driveway, was closely investigated to see if it could be a structure. No artifacts of any kind were found around or on the deposits. The shape was amorphous, and it could not be determined whether this was a small structure, a disturbed area, or an area where loads of earth from another location had been dumped, which might have introduced artifacts to the property. We concluded that this area did not appear to originate as a Pueblo structure and was not the locus of fourteenth century or later occupation of the site. It was decided that excavation would be necessary to establish the age of the site, and that surface collection was not an adequate alternative.

Physical Environment

The Merrigan site is situated on a knoll overlooking the Pojoaque River, the principal tributary of the Rio Grande, in the area today known as El Rancho, New Mexico. Both the ancient and modern hamlets are located south of Espanola and just west of Pojoaque, New Mexico (Espanola Quadrangle, Township 19 N, Range 8E, Sections 11 and 14).

The location of LA 110971 takes advantage of intersecting environmental zones and their resources, among them the riparian resources along the course of the Pojoaque, the grasslands in the immediate vicinity, and patches of piñon-juniper woodland that are present nearby. The river provided a source of water some 300 meters distant from the site. The area beyond the river and its associated swath of riparian vegetation is dominated by grassland with piñon and juniper pines. Other grasses, four-wing saltbush, sagebrush, rabbitbrush, prickly pear, and cholla cactus are present in the ara. Although it covers a relatively small area, the riparian habitat includes a greater range of plants, those mentioned along with a number of species having economic value. These species include Rocky Mountain beeweed, Indian ricegrass, three-awn grass, side-oats grama, and flax. The Pojoaque is one of the few perennial streams in the region and also supports cottonwood, willow, tamarisk, rushes, and sedges (Moore 2000:10–11).

The choice of this location indicates the residents' interest in taking advantage of resources of the ecotone. The raised knoll location rather than a low-lying site afforded a way to maximize visibility over the surroundings, take advantage of occasional breezes, and build structures in a higher and therefore dryer place. Building on a dryer site could have been a means to escape overly moist housing sites or to preserve wetter sites for cultivation and farmland.

LA 110971 is situated on the western margin of the Espanola Basin, a portion of the Rio Grande Rift, a series of basins formed by faulting. The faulted rocks in this area are Tertiary sedimentary deposits (Hudspeth 1997:10). Soils in this area are predominantly loam, including fine, sandy, and gravelly loams with varying potential for dry farming and irrigation (Post 1996:7). Ellis has suggested that occupations like the Merrigan site might have been seasonal habitations by groups that spent the rest of the year living at LA 835, a cluster of habitations farther east, near the modern town of Pojoaque (Ellis 1975), although other alternatives will be discussed. Information on the physical environment reflects people's choices of where to settle, when, and for how long. These choices in turn bear on where and when aggregation might begin, and what a permanent autonomous extended-family settlement might look like, as opposed to a seasonal encampment.

Research Objectives

This work is part of continuing research on change in population in the northern Rio Grande region by the Northern Rio Grande Research Project, sponsored by Northern Illinois University and the Field Museum. This fieldwork developed out of an interest in the emergence of centralization following aggregation of population in ever-larger villages in the American Southwest. Fieldwork at LA 110971 investigated the role of small sites in permitting and fostering population aggregation, which reached a peak in the large northern Rio Grande villages of the fifteenth century. One of our research interests in exploring the Merrigan site was to document the initial stages in the process of aggregation, which began in earnest during the fourteenth century with the construction

of Arroyo Hondo (LA 12), outside Santa Fe. Excavations elsewhere have been aimed at identifying the factors that fostered aggregation (threat, large-scale immigration, competition for hunting and cultivating spaces and for water, cooperation, common religious beliefs) and at recognizing countervailing forces (desire for privacy, family-level production, lack of leadership, and absence of centralized economic or political institutions). These factors are examined at LA 110971 as well.

Prehistory of the Region

Since archaeological work began in the northern Rio Grande region, not long after the turn of the twentieth century, a number of chronological frameworks have been proposed for the region. The first scheme was suggested by H. P. Mera, based on archaeological survey in northern New Mexico (Mera 1934, 1935). The chronology he presented was revised by Stubbs and Stallings (1953). A chronological sequence that relied less on contacts with Chaco and Mesa Verde and focused on cultural developments within the northern Rio Grande region was developed by Wendorf and Reed (1955), and it is their sequence that has been widely adopted for use across the region. It is ironic that although the Pecos classification was developed for the northern Rio Grande, it works poorly within the region, and the outline suggested by Wendorf and Reed has become the preferred chronology. Divisions include the Preceramic (pre-A.D. 600), Developmental (A.D. 600–1200), Coalition (A.D. 1200–1325), and Classic (A.D. 1325–1610) periods.

The earliest known occupants of northern New Mexico were Paleoindian bands of big-game hunters who relied on mammoth, bison, and other now extinct animals as an integral part of their subsistence (Judge 1973). Sites of the Paleoindian period (9500–6000 B.C.) are nearly absent from the northern Rio Grande region, however. A few finds of isolated late Paleoindian artifacts have been reported from the Galisteo Basin (Honea 1971; Lang 1977). Elsewhere in the state, however, Paleoindian sites have been recorded, including the type sites for Clovis and Folsom, along with examples of the Midland and Cody complexes (Stuart and Gauthier 1988).

The end of the Paleoindian period saw the emergence of the more generalized hunter-gatherer subsistence strategies of the Archaic period, from 7500 B.P. to about 1500 B.P. Until recently, Archaic sites were best known from the Albuquerque area, including sites in the Sangre de Cristo range (Wendorf and Miller 1959), in the foothills of the Sandia Mountains, and in the Rio Rancho area (Reinhart 1967). Sites consisted of semipermanent base camps and brief-use, special-purpose sites, like those described by Fawcett (1974). Most sites were located well away from the Rio Grande (Skinner et al. 1980:13). More recent research in the Santa Fe area (Post 1996) has revealed more extensive Archaic occupation in the northern Rio Grande. The transition to hunting smaller game and greater utilization of plant food may have made Archaic sites among the least visible to archaeologists (Post 1996:11). During this lengthy period, sites are generally identified from distinctive projectile point styles. In his study of the Archaic period in the Santa Fe area, Post (1996) notes, "Early and middle Archaic period materials are similar to the Jay (5500 to 4800 B.C.), Bajada (4800 to 3200 B.C.), and San Jose (3200 to 1800 B.C.) phases of the Oshara tradition (Irwin-Williams 1973)" (1996:11). As identified by Irwin-Williams (1973), the Oshara tradition demonstrates the first steps toward regionalization, as over time, differences in settlement pattern and material culture can be distinguished as hunting and gathering groups adapted to local conditions such as availability of water, range of plant foods, and movement patterns of hunted animal species. The later phases of the Archaic/Early Basketmaker period are similar to later phases of both the Oshara and Cochise traditions (Post 1996:11).

In the area just south of LA 110971, Post identified Armijo-phase (1800–800 B.C.) sites which are suggested to indicate increasing use of piedmont and woodland environments, a shift supported by excavations elsewhere in the Santa Fe region (1996:440). Even more numerous were projectile points characteristic of the subsequent En Medio/Basketmaker II period (800 B.C.–A.D. 400). Sites identified from this period included a range of functions, from habitations to special-purpose localities (1996:441). Sites of this period, ranging from pit houses a meter deep to structures built in shallow pits, can be found in riverine, piedmont, foothill, and montane settings. The increased diversity in settlement types and locations suggests an overall population increase (Boyer and Lakatos 2000:70).

During the subsequent Developmental period (A.D. 600–1200), there was an increase in the

number of permanent settlements, and the production of ceramic vessels began. In the earliest phase (A.D. 600–900), sites consisted of small groups of one to four pit houses, which sometimes had associated extramural storage pits or activity areas. Sites were located on low river terraces, such as the earliest jacal structures at Pindi (Stubbs and Stallings 1953:24–25) and the pit house in Area B at the Tesuque By-Pass site. The overall trend toward decreased mobility and increased storage and the introduction of artifacts such as trough metates suggest an increased reliance on cultivation. Ceramics associated with Early Developmental sites include plain gray and brown wares, and San Marcial Black-on-white (Cordell 1979:43; Boyer and Lakatos 2000:72).

The Late Developmental period (A.D. 900–1200) was characterized by greater variety in both construction and material culture. Settlements typically consisted of one or more pit houses and sometimes a number of aboveground structures. Unlike earlier pit houses, which tended to be a meter deep, these later structures ranged from 30 cm to over 1 meter in depth (Boyer and Lakatos 2000:73). Aboveground rooms were generally made of adobe and appear to have been first constructed for storage, as they lacked interior features. Features such as hearths or ash pits were apparently added when the aboveground rooms began to be used as living quarters. Characteristic ceramics of this period include Red Mesa, Kwahe'e, Gallup, and Escavada Black-on-white decorated types. Types found infrequently at Late Developmental sites include Chupadero, Socorro, Chaco, and Chuska Black-on-whites. Neckbanded and plain ceramics continued from the Early Developmental period, with the addition of corrugated and incised types. Some intrusive examples of red wares are also found, part of the high variability in ceramics and presumably reflecting external contacts among the occupants of the region during this period.

Late Developmental period sites include pit structures (LA 9140), sometimes combined with jacal (LA 191) or masonry (LA 10614) aboveground structures (Dickson 1979) . Perhaps the best known Late Developmental period site is LA 835, where ten units of seven to 15 contiguous adobe rooms were identified. These were distinguished as both living rooms and storage rooms (McNutt 1969). Additional examples of the Late Developmental period include sites in the Las Campanas project area (Post 1996:442–443) and the Santa Fe to Pojoaque Corridor, including additional work at LA 835 (Boyer and Lakatos 2000; Boyer, Moore, and Lakatos 2001). The shift from pit house to aboveground architecture was first delineated by Dickson (1979). In his survey transect from the Rio Grande to Arroyo Hondo Pueblo (LA 12), he noted a mix of pit house sites and sites with aboveground pueblos (1979:30–31) that illustrated the period of transition. The most intensive occupation during this phase was along the Santa Fe and Tesuque Rivers and their tributaries (Wiseman 1989).

In Bandelier National Monument, there was great variability among Late Developmental structures, which ranged "from pithouses and small surface structures to 100-room pueblos" (Powers and Van Zandt 1999:23). Late Developmental sites, those bearing Kwahe'e Black-on- white ceramics, first appear around A.D. 1150 (Powers and Orcutt 1999:553). Unlike the pit structures described for the valley areas north of Santa Fe, the early structures at Bandelier were rectangular, aboveground living and storage rooms, that is, rooms both with and without a hearth. Sites in Bandelier National Monument appear to have consisted largely of rectangular surface rooms, and no pit structures were recorded during the survey. The earliest structures built in the Bandelier survey area are suggested to date to around A.D. 1150, and the ceramics associated with them include corrugated ware and Kwahe'e Black-on-white (Powers and Orcutt 1999:553). The ceramics are similar to those found at LA 110971, but the architecture is different.

The time from about A.D. 1200 to around 1325 is known as the Coalition period. During this time aggregation into large villages began in earnest in the northern Rio Grande region. Maximum site size increased from approximately 100 to 1,000 rooms. Grid gardens and other forms of gravel mulch were introduced during this time as reliance on horticulture became more common. The earlier, Pindi phase (A.D. 1200–1300), was characterized by small villages and farmsteads. The later Galisteo phase was defined to recognize sites having the Galisteo variant of Santa Fe Black-on-white as part of the ceramic assemblage. Galisteo Black-on-white appears to have been introduced around A.D. 1300, and is associated with large pueblos, which became typical during the Classic period.

The Rio Grande Classic period lasted from about A.D. 1325 until 1610. During this period most of the region's population lived in large villages. Late in the Rio Grande Classic period, in

A.D. 1540, the first European explorers arrived in the region. The results of exploration included eventual population decline and cultural change (Creamer and Haas 1998; Creamer 2000).

Research Approach and Methodology

Research at LA 110971 has examined the process of centralization that occurred in tandem with population increase and aggregation in the northern Rio Grande valley. Beginning in the late 1200s with the abandonment of the San Juan Basin and Four Corners region, an increase in the population of the northern Rio Grande region is apparent from an increase in the number and size of sites. A tremendous aggregation of population followed, continuing into the mid-1400s.

There would be no reason to expect a transition from dispersed hamlets to large aggregated villages unless common concerns fostered or forced such a change in settlement. Our excavation was aimed at identifying factors that might have fostered aggregation, such as threat, large-scale immigration, and competition for water, hunting territory, and cultivable land. Cooperative activities may have included pooling labor to intensify production, the development of common religious beliefs, and the construction and maintenance of alliances. Countervailing forces that would have tended to drive people apart could have included the desire for personal privacy, family-level production, lack of leadership, the absence of centralized economic or political institutions, and religious secrecy.

Although excavations at LA 110971 were originally intended to examine the role of small sites during the fourteenth century, the early dates for the site forced a shift in research focus. The revised goals were to look at the range of functions present in small sites prior to the onset of aggregation and to assess the degree of local self-sufficiency of a small, independent site. Such sites have been suggested to have been part of a larger but decentralized socioeconomic and political community. For example, Ellis has suggested that LA 835 was the principal or permanent center uniting the smaller sites in the area of LA 110971, the upper Tesuque Valley (1975:41). Thus, we examined the evidence for permanence of LA 110971. If the site appears to have been a seasonal farmstead, it will support Ellis's theory. If the site was a year-round settlement, we need to consider what its role may have been during subsequent regional integration.

II. Excavations

To identify excavation units across the site, a grid of stakes laid out at 2-meter intervals was placed on a N/S axis aligned on magnetic north. An effort was made to place the central datum where it was located during Legare's (1995) work at the site, but the former datum stake could not be identified. The excavation datum was placed at the top of a low rise where the structures are situated. Test units outside the site center were selected to identify the maximum extent of site debris. Units were designated by the distance from the 0,0 point to the corner farthest from 0,0. Excavation of a 162-square-meter area revealed rooms and outdoor work space. Testing began with grid units excavated with shovels until room walls were identified.

Excavations began in unit N1 E1 with the goal of relocating and defining the possible work surface that had been tentatively identified during the testing operation (Legare 1996). Unit N1 E1 did not yield clear evidence of a work area but did yield three artifacts, a hammerstone, a large plain ware sherd, and a quartzite grinding stone, all at about the same level below datum in the southwest corner of the unit. Although there were no signs of a surface beneath these objects, at about this same level along the south margin of the unit was a cluster of slabs. Two of the slab fragments fit together, and all the pieces exhibited some evidence of grinding. As a result of these finds, excavation was extended to the adjacent unit, N1 W1. A curving wall segment was recognized in the excavation of the unit, enclosing a room that was numbered Room 1. The other materials found were associated with Room 4.

After Room 1 was identified, excavation expanded outward, resulting in the discovery of Rooms 2 through 7 to the north and east of Room 1. A number of units were excavated to the west and south. While most of these units contained some artifacts, the frequencies were low and the soil was very shallow. We concluded that the concentration of rooms was the entirety of the site architecture, forming a cluster that trended southwest to northeast across the crest of the knoll at LA 110971. Based on the frequency of artifacts, we also concluded that site midden was concen-

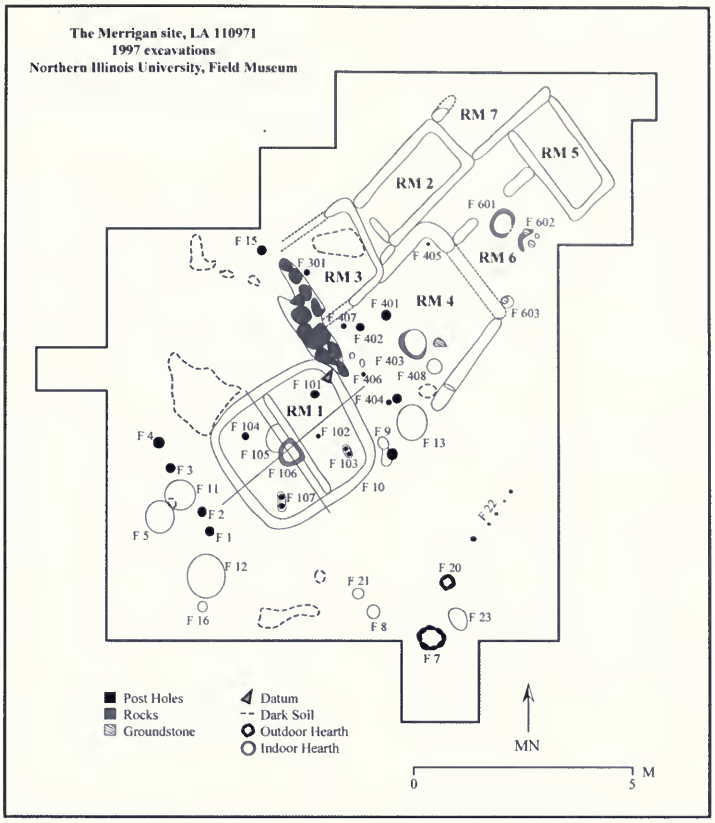

FIG. 2. Plan map of excavated structures at LA 110971, the Merrigan site.

trated around the structures and to the east. It appeared that trash was discarded to the east outside the structures. The subrectangular structures may have opened to the east, which would make disposal to the east the path of least resistance. Further, the hill sloped most steeply in that direction, and it was the side of the site away from the river, which passes to the south and west of the site.

The remainder of the fieldwork carried out in 1997 focused on excavating all the structures that we identified, on excavating a test trench along the north side of the site, and on testing the remainder of the hilltop for other possible structures. Descriptions of the individual room excavations provide greater detail about those excavations.

Field Methods

The entire site surface was covered with loose sand and thick grass. For this reason, the first few centimeters of each unit were designated as a surface (S) level. Each surface level is likely to have been disturbed by historic and modern activities, including trampling by horses and cattle as well as human activities associated with nearby structures. There was broken glass in a number of places across the site surface, and several casings of spent ammunition were found in surface levels as well.

Stratigraphy was shallow throughout most of the site, with wall fragments and floor surfaces located about 30 cm below the present ground surface. The site was dug in natural layers when visible and in 20-cm arbitrary levels when natural stratigraphy could not be discerned. As structures were identified during excavation, each was numbered sequentially, with structures numbered 1 through 7 (Fig. 2). Room 1, the best preserved structure, was excavated in four units. First, the room was divided in half across its N/S and E/W axes. The eastern and western quadrants were excavated first, and a section was drawn across the room. The remaining quadrants were then exca-

vated. Each of the other Rooms 2 through 7 were excavated in halves in natural levels. In areas where no rooms were identified, grid squares were excavated down to sterile soil.

All features were mapped and excavated separately. Feature excavation was carried out in two stages. One-half of each feature was excavated, a section drawing was made of the bisecting profile, and the remainder of the feature was then excavated. During excavation, a 2-liter soil sample for flotation and a pollen sample were collected from each 20-cm level. Additional samples were collected from each feature, hearth, and any unusual concentration of ash or dark-colored materials. Additional pollen samples were taken from the corners and center of each room floor.

Extramural features were numbered sequentially from 1 to 24. Features within the boundaries of a room were numbered with three digits: first the number of the structure, then two digits identifying the order in which the features were uncovered within the structure. Thus, feature 101 is the first feature recorded in Room 1, for example. Test units, including the materials over the structures, were numbered with a north or south coordinate and an east or west coordinate, e.g., N1 E1. Any features revealed during excavation of a test unit were assigned a one- or three-digit number, depending whether or not it was within the boundaries of a structure.

Architecture

The primary occupation area at LA 110971 consisted of seven rooms in close proximity to each other. There were three living rooms overlapping or connected to each other, and four storage rooms, also connected to each other. Each living room had a hearth feature located near the center. The walls of the rooms were made of adobe, although only the bases of the walls were found during excavations. The walls had mostly eroded away, and there was no evidence of the roof structure in any of the rooms. All of the rooms appeared to have been built in the same way, with puddled adobe. The fill of all the rooms included soil deposited by wind and erosion. The adobe from the walls was eroded by rainfall, which resulted in the puddling of adobe on room floors and outside room walls.

Room 1

Length: 3.6 m
Width: 3.9 m
Area: 14.04 sq m

Room 1 was a square structure with rounded corners (see Fig. 2) located at the south end of the occupation area next to Room 4. Patches of floor were detected in Layer III. An adobe wall bisected the room on a diagonal N/W to S/E axis. The wall appears to have been made of puddled adobe, although the pattern of erosion made it appear superficially to have been assembled of adobe blocks. There was some slumped adobe on the floor of the room and outside the wall of Room 1, but the quantity was relatively small and suggests the room had a jacal, or wattle-and-daub, superstructure over a low adobe wall. However, the preserved portion of the wall did not contain post holes that might have supported such a superstructure, so this reconstruction is somewhat speculative.

A hard-packed level that included a portion of the room floor may indicate a former use surface, one that was associated with the occupation of Room 1. If that is the case, then the room was a shallow pit structure, with a slightly excavated or dish-shaped floor. This is the only excavated room where a large section of floor surface was preserved, which we interpret as indicating the final occupation of the site.

Room 1 was excavated in quadrants established once the walls were identified. Transects divided the room into quadrants: north, east, south and west. The north and east quadrants were excavated in artificial levels and the south and west quadrants were dug in natural layers identified in the cross-section profile (Fig. 3).

North Quadrant—This quadrant contained a large amount of melted and crumbled adobe which was probably once part of the walls. The first level of the room produced lithics, sherds, adobe, and a carbon sample. A charcoal layer was found in level 3. Below the ash was more melted adobe. There was a post hole feature (feature 101) in this quadrant, along with portions of the wall that bisected the room, the hearth, and the associated ash pit.

East Quadrant—The first level produced charcoal flecks, ash, ceramic material, and lithic material. The ashy deposits were located in the

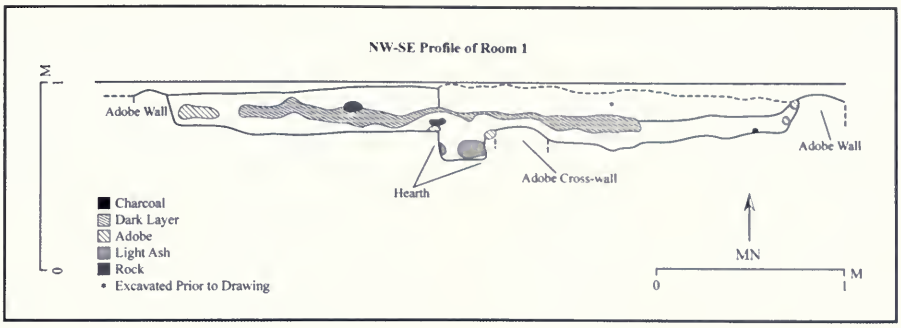

FIG. 3. Section view of Room 1 at LA 110971.

south and west corners. Levels 2 and 3 included a number of lumps of amorphous melted adobe. Level 4 produced an ash deposit in the west corner that may have been part of the hearth. The entrance to the structure may have been along the east quadrant of the room. Although the remains of an adobe wall were found around the circumference of Room 1, the presence of such a wall was difficult to detect in the eastern quadrant. Further, the soil along the eastern margin of the structure was more pebbly than elsewhere and more mottled in color. These characteristics are consistent with that zone having been an entrance. In addition, feature 102 is a possible sipapu. It was approximately 10 cm in diameter and just under 10 cm deep. No artifacts were found in this feature, although the soil in it was slightly darker than the soil outside the feature. Feature 103 was a pair of post holes, perhaps a post hole that had been reworked at some point. Portions of the cross-wall and the hearth were in this quadrant.

SOUTH QUADRANT—The fill in Layer I consisted of charcoal-flecked soil and adobe chunks. The layer ended at an ashy, charcoal-flecked lens. A hammerstone, ground stone, and small sherds were removed from Layer I. Layer II produced a concentration of artifacts, charcoal, and also burned adobe in the north corner of the quadrant. A small turquoise bead was found in Layer II at 139 cm below datum in the east corner of the quad. Layer III produced a smaller number of sherds and lithics. The floor was difficult to discern, as it was thin and eroded. Bedrock was reached at the bottom of the layer along the south side of this quadrant. The south quadrant also had a pair of post holes (feature 107) that appeared to indicate that a post had been repositioned at some point. As in the other quadrants, feature 106, the hearth, was part of the south quadrant excavations.

WEST QUADRANT—The top layer excavated produced a large amount of ash in the east corner, along with a hammerstone and a large sherd. Some lithics and sherds were found in Layer II. A patch of floor was found at the bottom of Layer III. A collared hearth was located in the east corner, along with various hearthstones. A burned corncob was recovered from the west portion of the quadrant. In addition to a corner of the hearth and rock-filled pit, a post hole (feature 104) was excavated in this quadrant of Room 1.

Features—Features 101 to 107 were located in Room 1 (Table 1). These features include post holes, a hearth, and an associated rock-filled pit. A collared adobe hearth, feature 106, was found in the southwestern half of the room (Fig. 4). This feature was set into the floor of Room 1, against the adobe wall in the center of the room. The hearth had been remodeled, and an earlier collar was covered by ash and the more recent collar. A depression in the floor, filled with smoke-blackened rocks, was uncovered adjacent to the hearth, and no collar of adobe separated the hearth from

TABLE 1. Features in Room 1, LA 110971.

Feature no.	Dimensions (cm)	Depth (cm)	Function
F 101	17 × 14	28	Post hole–roof support
F 102	11 × 9	10	Post hole
F 103	36 × 24	28	Post hole–roof support
F 104	10 × 10	10	Post hole–roof support
F 105	61 × 57	11	Rock-filled pit
F 106	52 × 48	15	Adobe-collared hearth
F 107	46 × 30	27	Post hole–roof support

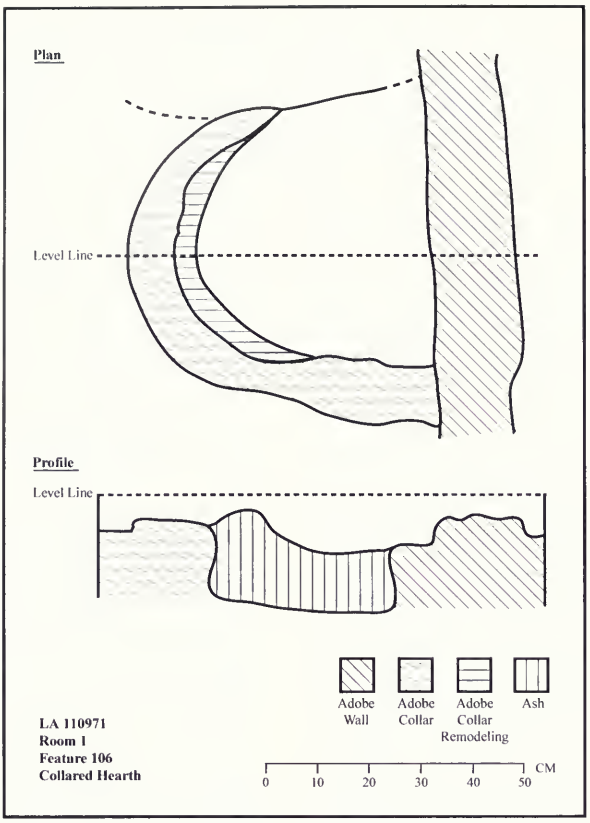

FIG. 4. Plan and section views of collared hearth in Room 1.

the pit of rocks. This feature could have been a cooking area, where materials could be heated with rocks from the fire.

The cross-wall was a later addition to the room, based on its abutment to the subrectangular walls of the room. A quantity of ash was found on the side of the center wall opposite the hearth. This and the position of the hearth against the center dividing wall may indicate an earlier hearth that predated the cross-wall. If such was the case, the hearth was a later construction, as it is D-shaped to fit against the cross-wall. Such a reuse would indicate that Room 1 was similar to Room 6 in having experienced remodeling of the hearth.

Four post holes (features 101, 103, 104, and 107) were found evenly spaced in the four quadrants of the room. The post holes and the surrounding low adobe walls suggest that Room 1 was a structure transitional between a pit structure and an aboveground adobe structure. The four corner posts would have supported connecting roof beams that held up the roof. The adobe base of the structure, uncovered during excavation, is similar to other structures built of puddled adobe. However, very little slumped adobe was removed during the excavation of Room 1, making it unlikely that the walls were solid adobe to roof height. Instead, the structures at LA 110971 appear to have been hybrid constructions with an adobe base, a perishable superstructure of jacal, and a thatched roof supported by a post-and-beam arrangement.

Room 2

Length: 2.7 m
Width: 1.3 m
Area: 3.51 sq m

Room 2 is a rectangular storage room adjoining Rooms 7 and 3 in a group extending northeast to southwest across the site. Rooms 4 and 6 adjoin Room 2 to the southeast. Room 2 was divided into two units for excavation. The southwest half was excavated first, followed by the northeast half.

The room consisted of three adobe walls abutting the northeast wall of Room 3. A use or living surface was difficult to detect in this room. The fill was very hard-packed, and an even surface or floor was not identified. Some rocky fill was excavated down to a sandstone outcrop in the southwest end of the room. No features were identified in this room.

The fill of Room 2 consisted of melted adobe, cultural refuse, and postabandonment soils that were probably deposited by the wind. A possible work surface was detected beneath the fill, although it was difficult to discern where the hard-packed fill ended and the work surface began. Several sherds and a fragment of ground stone were recovered at the same level as the proposed work surface beneath the fill and above culturally sterile soil. No post holes or roof materials were found in Room 2.

Room 2 may have been added on to Room 3, as its northwest wall abuts a wall of Room 3. However, two wall stubs added on to the south corner of Room 2 are difficult to interpret. They may have been later additions to Room 2, or possibly remnants of an earlier room largely destroyed during the construction of Room 3. The three complete walls of Room 2 (northwest, northeast, and southeast) appear to have been built at one time, perhaps as a single unit, since no wall abutments were visible.

Features—No features were found in Room 2.

Room 3

Length: 2 m (est.)
Width: 2 m
Area: approx. 4 sq m

Room 3 is located next to Room 2 and Room 4 on the northwest side of the occupation area. Its walls were highly deteriorated, with adobe outlines defining the approximate location of three walls. The southwest wall was absent, and a natural bedrock outcropping may have formed the southwest wall of the room. The very few artifacts identified in the fill of Room 3 included two culinary sherds, two corrugated sherds, and two fragments of chert debitage. No evidence of a room floor was present. The soil was gravelly.

Room 3 may have been built over an earlier room, represented by wall stubs at the southeast corner of Room 2. However, the sterile surface uncovered during excavation argues against Room 3 having been built over another room. That is, if Room 3 replaced an earlier structure, it was not built over an earlier room as much as an earlier room was removed and then Room 3 was constructed. The sterile surface uncovered during our excavation was near the surface, and there were no layers of trash or adobe under the room walls to suggest a prior structure. We would expect to find such materials had Room 3 been built over an earlier room, because in the Southwest there is no tradition of completely clearing one construction before rebuilding. Rather, it is more common for one structure to be demolished only enough to create a level surface before new construction begins.

Alternatively, Room 3 may have been constructed before all of Room 2. The walls identified for Room 3 appeared to have been constructed before those of Room 4, based on the pattern of wall abutments. The short stubs of adobe wall extending from the southeast corner of Room 2 to Room 3 could have been later additions.

Features—Feature 301, a single post hole 15 × 14 cm in diameter and 11 cm deep, was discovered in the northwest corner of Room 2. An extensive patch of gravelly soil was identified in the north half of Room 3. This patch appears to have been below the original use surface of the room, however, and is probably just above bedrock, which is quite near the surface in this part of the site.

Room 4

Length: 4 m
Width: 4.2 m
Area: 16.8 sq m

Room 4 is one of the large rooms at LA 110971. It is centered between Room 1 and Room 6 and located to the southeast of Room 2 and Room 3. A work surface, a hearth, post holes, and pits were found at the base of Layer 1 of this room. For the purposes of excavation, the room was bisected along a northwest-southeast axis. Two large ground stone slabs were recovered in the first layer of the southwest half. The floor area was difficult to identify, with only patches around the central hearth and some of the other features remaining intact. Artifacts from Room 4 included a few plain and corrugated sherds, one Black-on-

TABLE 2. Features in Room 4, LA 110971.

Feature no.	Dimensions (cm)	Depth (cm)	Function
F 401	15 × 12	12	Post hole
F 402	20 × 20	20	Post hole
F 403	75 × 65	13	Hearth
F 404	17 × 14	24	Post hole
F 405	7 × 7	13	Post hole
F 406	9 × 7	5	Group of three pits
	19 × 11	9	
	12 × 12	7	
F 407	15 × 15	12	Pit
F 408	56 × 47	14	Pit

white body sherd, one fragment of basalt debitage, and two hammerstones.

Room 4 appears to have been a living room, based on the presence of a hearth in the center, which exhibited remodeling similar to that noted in the other living rooms. The wall abutments along the north/northwest portions of the room make it appear to have been built after Room 3, and possibly after Room 2 as well. It is not clear whether Room 4 was built after Room 6, which might be suggested by the curved north corner of the room jutting into space that could have been part of Room 6. As in Room 1, the roof was probably held up by posts set in each corner of the room, although only two post holes for roof supports were clearly identified in Room 4.

A cluster of artifacts associated with the room was excavated as part of unit N1 E1. The outer margin of Room 1 wall runs through the extreme southwest corner of unit N1 E1. Thus the three artifacts found, a hammerstone, a sherd, and a grinding stone, initially thought to be associated with Room 1, were probably inside Room 4. The cluster of slabs also found in N1 E1 were probably associated with activities in Room 4.

Features—Features 401 through 408 were identified in Room 4 (Table 2). These features included post holes and a series of pits. The collared hearth, feature 403, was remodeled, because the rim of adobe around the edge of the hearth had been reshaped at least once. A sherd was recovered during the excavation of the hearth.

Room 5

Length: 2.5 m
Width: 1.5 m
Area: 3.75 sq m

Room 5 is a rectangular storage room located at the northeast end of the site, next to Room 6 and perpendicular to Room 7. Artifacts collected from Room 5 included lithics and sherds. The fill was very rocky, and a large amount of adobe wash had eroded from the walls into the room. The walls of Room 5 were very low (10–15 cm), and it seems likely that the wall stubs encountered in the course of excavation were below the level of the original room floor. A variety of artifacts were recovered from the room fill, however, including basalt, chert, obsidian flakes and debitage, a fragment of petrified wood, a fragment of ground stone, six plainware sherds, five corrugated sherds, and one Black-on-white sherd.

Room 5 was constructed after Room 7, as three of the walls (northeast, southeast, and southwest) abutted the northwest wall of Room 7. The southwest wall of Room 5 formed one wall of Room 6.

Features—No features were found in Room 5.

Room 6

Length: 2.5 m
Width: 2.5 m
Area: 6.25 sq m

Room 6 is large, square room that was probably a living room. It adjoins Room 2 and Room 5. The wall between Room 4 and 6 was badly deteriorated, creating a broad band of adobe melt. The fill in Room 6 was heavily mottled with ash and flecked with charcoal, making Room 6 look like it might have been a refuse area. When feature 601, a collared hearth, was identified in the center of the room, a search for room walls was undertaken. However, feature 601 was surrounded by walls that were originally part of other structures, and no walls unique to Room 6 were found. Thus, Room 6 is defined largely by the hearth features (features 601 and 602) rather than by walls. Therefore, this room could have been in use before the adjacent Rooms 4, 2, and 5 were built. In this case, the original walls of Room 6 were all replaced by later structures. Alternatively, Room 6 may have been built later than Room 4, with the builders taking advantage of the existing walls to form the room. In this case there may have been a perishable wall across the southeast side of the room, where no wall was uncovered during excavation.

TABLE 3. Features in Room 6, LA 110971.

Feature no.	Dimensions (cm)	Depth (cm)	Function
F 601	55 × 60	27	Adobe-collared hearth
F 602	64 × 62	22	Pit of former hearth with stones in adobe collar
F 603	58 × 54	54	Post hole

In addition to being bordered by walls associated with other rooms, two short walls intruded into the area called Room 6. When we completed excavation of the room, it became apparent that the two short walls had originally been joined in a single wall bisecting the interior of Room 6. This is similar to the layout of Room 1, where the later hearth also backs onto an added bisecting wall. It appears that feature 602 would have been the original hearth for this room. When the cross-wall was built, the later hearth (feature 601) was constructed against the cross-wall, as was the case in Room 1.

Features—Feature 601, an adobe-lined hearth, was located in the center of the room (Table 3). Another collared hearth (feature 602) was discovered near the first. This hearth appeared to have been reused as a storage pit. No ash was found in 602, and a number of stones were found along the collar of the hearth, although several segments of the curved adobe edge were missing. Feature 603 was a large post hole or possibly a wall footing. There was evidence of a hard-packed surface beneath the hole, and it looked as if the hole had been filled in with rock and adobe around a perishable object, possibly a roof support post.

Room 7

Length: 2.5 m (est.)
Width: 1.3 m
Area: 3.25 sq m (est.)

Room 7 was located at the northernmost edge of the excavation, abutting Rooms 2 and 5. Only two walls of the room were fully preserved, along with a stub of a third. However, the room appears to have been another in the series of small aboveground rectangular storage rooms constructed at the site. From the abutment of the walls, it is apparent that of the three, Room 2 was built first, Room 7 next, and Room 5 last in the series.

TABLE 4. Exterior features around Rooms 1 through 7, LA 110971.

Feature no.	Dimensions (cm)	Depth (cm)	Function
F 1	19 × 16	17	Post hole
F 2	26 × 20	26	Post hole
F 3	24 × 25	29	Post hole
F 4	28 × 25	5	Post hole
F 5	58 × 76	15	Shallow pit
F 6	(This feature number was not used.)		
F 7	70 × 80	81	Fire pit
F 8	32 × 35	3	Pit
F 9	35 × 30	4	Pit
F 10	60 × 42	8–18	Overlapping post hole and pit
F 11	71 × 51	10	Pit
F 12	190 × 140	10	Pit
F 13	85 × 816	8	Pit
F 14	(This feature was renumbered F 401. See discussion of Room 4.)		
F 15	23 × 23	17.5	Post hole
F 16	30 × 27	11	Pit
F 17	(This feature was renumbered F 104. See discussion of Room 1.)		
F 18	(This feature number was not used.)		
F 19	(This feature number was not used.)		
F 20	30 × 34	30	Hearth
F 21	33 × 33	10	Pit
F 22	This feature was a row of post holes, spanning 160 cm:		
	5 (diam.)	10	Post hole
	10 (diam.)	10	Post hole
	15 (diam.)	10	Post hole
	10 (diam.)	12	Post hole
	8 (diam.)	15	Post hole
F 23	56 × 65	16	Pit
F 24	330 × 70	40	Possible wall segment

Features—No features were identified within the room, and no artifacts were located in situ.

External Features

Twenty-three features were found outside the rooms at LA 110971. Most of them were located to the south of the roomblock. The dimensions of each feature are given in Table 4.

HEARTHS—Feature 7 was a rock-lined hearth located just over 4 m southeast of Room 1. Ground stone, flaked lithics, and ceramic material were all recovered from the feature. The top fill consisted of ashy soil and charcoal. The pit was partially filled with fire-cracked rocks and large pieces of charcoal. Beneath them, large slabs lined the hearth (Fig. 5). Much of the stone was

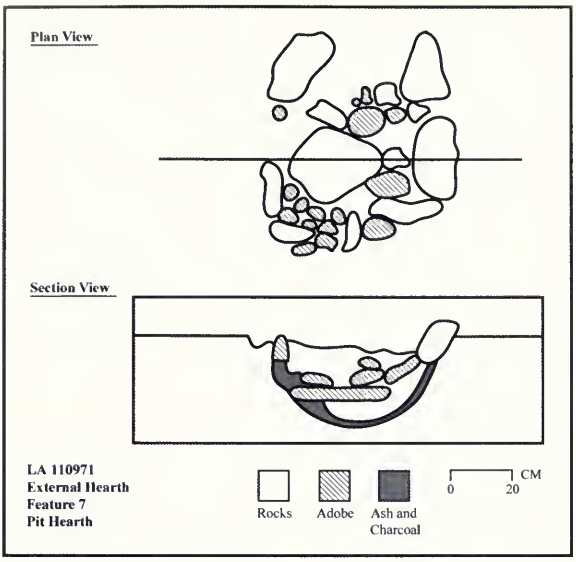

FIG. 5. Plan and section views of exterior hearth, feature 7.

fire-cracked. The soil beneath the slab lining was reddened and appeared to have been exposed to heat.

Feature 20 was an unusually small, rock-lined hearth. Some of the lining stones were discarded ground stone tools, including mano and metate fragments. The fill became darker toward the bottom of the feature (Fig. 6).

Both of these features were located in a way that suggests they were associated with Room 1. If feature 22 represents the edge of a brush shade, or *ramada,* that extended outward from the edge of Room 1, then the hearths, features 7 and 20, were positioned to be as close to Room 1 as possible without being under a roof.

POST HOLES—Features 1 through 4 are a group of post holes aligned on a northwest-southeast axis. These features seem to belong together, based on their close proximity. They are spaced about a meter away from Room 1 and parallel to the room's southwest wall. Feature diameters are

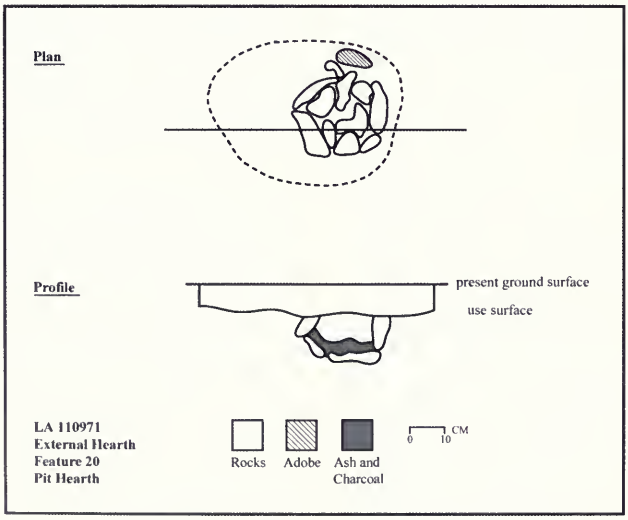

FIG. 6. Plan and profile views of small exterior hearth, feature 20.

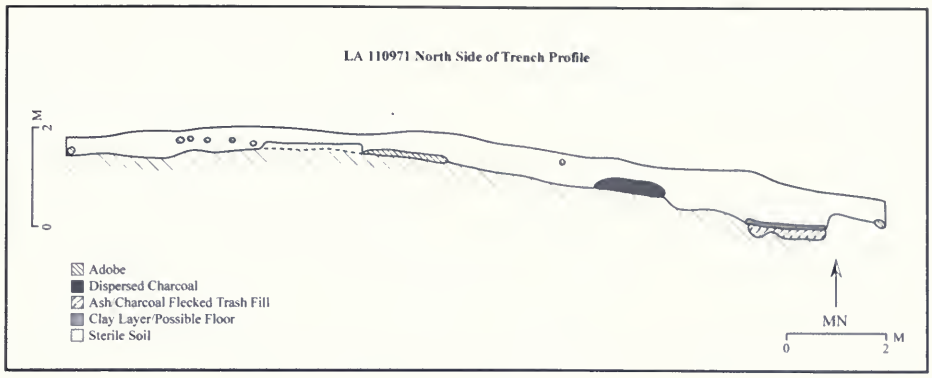

FIG. 7. Trench profile for LA 110971.

similar, ranging from 20 cm to about 30 cm. Features 1 through 3 extend approximately 25 cm below the surface. Feature 4 had suffered rodent tunneling disturbance, which made it impossible to determine the original depth. Together, this row of post holes may have supported a row of posts that held up a *ramada.*

Feature 15, located at the west corner of Room 3, probably outside the room, was a post hole with charcoal flecks in its fill.

Feature 22 was an alignment of five post holes, each about 7 cm in diameter. The alignment spanned 160 cm, and the holes reached from 5 to 15 cm in depth. The surface into which the post holes had been dug consisted of adobe, and the fill in the holes was gravelly. Wood samples, remnants of the original posts, were recovered from these post holes. The posts in this feature were smaller in diameter than the posts in features 1 through 4. This feature may also have held up a *ramada,* or it could have been part of a pen enclosure of some kind, such as for turkeys or for outdoor storage. However, no turkey shell, dung, or other evidence of turkeys was recovered from the site.

PITS—Features 5 and 11 are two similarly sized pits located in the center of feature 22 (aligned post holes). Both pits appear to have been filled by aeolian deposition after abandonment of the site. Feature 5 contained one flake and one sherd; feature 11 had two lithics.

Features 9 and 10, located about 10 cm east of the east corner of Room 1, were shallow pits. These pits had dark fill, and feature 10 had a blackened rock at the bottom. They could have acted as pot rests, temporary storage spaces, or a number of other functions.

Features 12 and 16 are located to the south of features 1 through 4. Feature 12 was a pit with aeolian fill resembling that in features 5 and 11. A small number of lithics and sherds were recovered from the fill. Feature 16, located directly to the south of feature 12, contained no artifacts.

Feature 21, a small pit, was roughly square in shape, with sides 33 cm long and a depth of 10 cm. A rock with no signs of cultural use was located in the pit. Feature 8, a shallow, dark basin of similar dimensions to feature 21, was located 30 cm southeast. This feature yielded a piece of fire-cracked sandstone.

Feature 23 was a pit located about 40 cm northeast of feature 7. The fill was dark, with charcoal flecks, and the feature yielded a large ground stone, lithics, and ceramic material. This may have been refuse discarded from the hearth, feature 7.

A POSSIBLE KIVA IN AN UNEXCAVATED PORTION OF LA 110971—A small section of LA 110971 remains unexcavated and may include an additional structure or structures. This is the section located at the northeast edge of the excavated portion of the site (see Fig. 1). A test trench was excavated across the northern margin of the excavated part of the site, crossing Room 7 and just north of Room 5. The trench was excavated in 1 m × 2 m sections, to form a cross-section of the site area. The depth of soil (including cultural material—charcoal flecks, chipped stone, and ceramics) above sterile subsoil increased as the test trench was extended to the east. In the final section excavated, a hard layer of clay was encountered that appeared to be melted adobe, or possibly a use surface (Fig. 7). This area is significant in being the only portion of the site where we

found any cultural material that we did not excavate. Time constraints and the depth of overburden prevented us from fully excavating this area. Also, the area was not endangered by pending construction.

The unexcavated portion of the site may contain a kiva. Sites of the Late Developmental period generally include pit structures and/or aboveground structures and shallow midden (Boyer and Lakatos 2000:72). While kivas are not common at sites of this period in the northern Rio Grande, a pit structure having a sipapu may represent occasional use for ritual purposes (Boyer 2000:82). Room 1 at LA 110971 has a feature that may be a sipapu. Thus, the site's inhabitants may not have found it necessary to build a kiva. Adler suggests that "larger, ritually specialized facilities" will be found at sites with a population of more than 200 individuals (Adler 1993:336; Boyer 2000:83), and a great kiva is present at LA 835. The question remaining is whether a large juniper tree growing in a shallow swale on the northeast corner of LA 110971 could mark the location of a kiva, which would be under more than a meter of sandy fill. The test trench along the north margin of the site extended out toward this area and indicated that the cultural deposits were deeper in this area. Each 1 × 2 m section of the test trench was excavated to sterile soil or bedrock. Analysis of the lower levels of the three easternmost test units, N4 E5, N4 E6, and N4 E7 showed that the number of artifacts in the lower levels declined only slightly from what was found in the upper levels. This suggests that the deeper deposits in this portion of the site came from later deposition. That the trench did not reveal any structures is not surprising if the materials represent postoccupation deposition. There were concentrations of adobe, charcoal, ash, and a few artifacts above the sterile subsoil. What makes it possible that a kiva or other structure is located in this area is the fact that at the interface between material bearing cultural materials and the subsoil or bedrock, there were two areas that may indicate cultural use. A patch of soil flecked with charcoal was identified in unit N4 E7, and a patch of trash flecked with ash and charcoal was uncovered in unit N4 E8, where there was also a hard clay area that could have been a piece of floor. Under it was an area of trash flecked with ash and charcoal. This kind of material is often used to level the ground surface under room floors.

Construction Sequence at LA 110971

LA 110971 consisted of four storage rooms and three living rooms, distinguished by the absence of features and rectangular shape of storage rooms and by the subrectangular shape and the presence of a hearth in the living rooms. By using wall abutments and the condition of rooms at the time they were excavated, it is possible to suggest that the site was occupied by a small group of people, a nuclear or extended family. Two scenarios of construction and occupation can be suggested. One scenario is of sequential construction and use, although this may have included continuous use or seasonal remodeling and reuse. The alternative scenario is that the site grew in size over time and structures were added as the size of the group increased.

Sequential use of the site is suggested by the pattern of architecture repeated from northeast to southwest across the site (Fig. 8a). The basic habitation unit included a single subrectangular room later modified by a cross-wall and containing a hearth, accompanied by two aboveground rectangular rooms. The aboveground rooms had no features or compacted floor surfaces, and we suggest these were storage rooms. In a sequence based on how much or how little of the room remains, Room 6 would have been the first to have been constructed. It was the most heavily eroded, the most difficult to distinguish as a room, and contained ash, charcoal, and other refuse. Room 6 included a cross-wall and adobe-lined hearth, both presumably added after the first circular hearth was no longer in use. The cross-wall and rebuilt hearth are similar to features in Room 1.

Room 4 would have been the next living room to have been built at the site, perhaps to replace Room 6 when that room fell into disrepair and the decision was made not to remodel. The northeast wall of the room was highly eroded, and the southwest wall was not identified. The shape of the room could only be inferred from the portions of three walls that were uncovered. A number of features were identified in the southwest half of the room.

Room 1 was the last living room to be constructed at LA 110971, based on its being less eroded than the other rooms. All the walls of Room 1 and the cross-wall through the room could be identified during excavation. Four post holes suggest that post supports for the roof were set in each corner of the room. A central adobe-

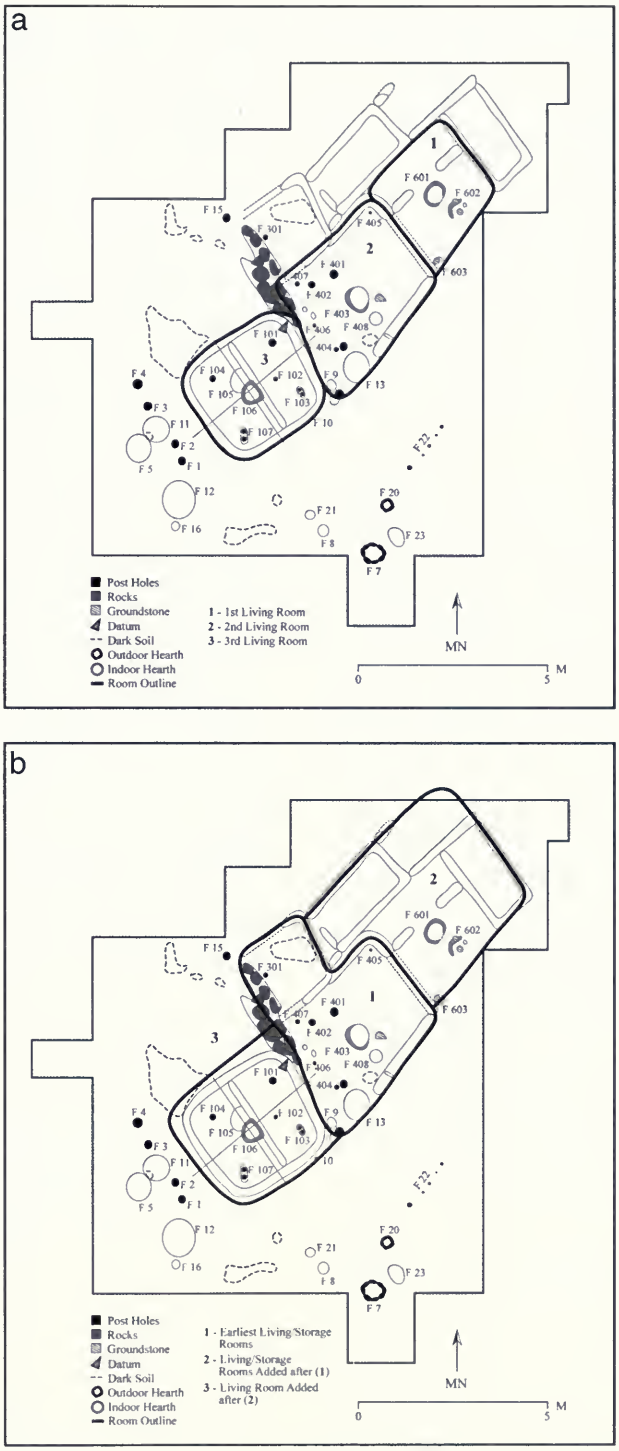

FIG. 8. Scenario for occupation of LA 110971. **a,** Sequential construction and use. **b,** Expansion of the group over time.

lined hearth, an adjacent rock-filled pit, and a very small pit feature, or sipapu, completed the interior of the room.

The first storage room to have been built, based on the remnants of its four walls appears to have been Room 3 or a possible earlier structure. Three of the walls were bonded together, and the southwest wall abutted the others. Perhaps this side held a door, although a doorway could not be identified. It is also possible that the first room constructed was adjacent to Room 2 but was later destroyed by construction of Room 3. In this case, the two remaining wall stubs attached to the southeast corner of room 2 would be the first walls of storage structures.

Room 2 would have been the next structure to be built, while Room 7 was added on to Room 2. Both its northwest and southwest walls abutted Room 2. Room 5 was added on to Room 7 in a similar way, with the southeast wall of Room 7 abutting three walls to form a new room. Room 3 may have been built over an earlier room and was built before Room 4, as its walls go around those of Room 3. A southwest wall was not located for Room 3, and it is possible that a rock outcrop was utilized for at least part of that wall. However, although Room 3 may have been built after Room 2, we cannot determine when it was built in relation to Rooms 7 and 5, which may have been constructed at the same time or later.

The orientation of the living rooms in a northeast-southwest row, each positioned the same way, suggests that the earlier structures were still visible when each subsequent room was built. The rooms could have been in ruined condition but still visible. In addition, the lack of ventilators for the habitation rooms suggests seasonal rather than year-round occupation. A ventilator would be especially useful in sites occupied during the winter, to keep the fire burning while sealing the walls of the structure as much as possible to keep out cold drafts.

An alternative scenario is that the site expanded with a growing group (Fig. 8b). In this scenario the first room built would have been for storage, perhaps prior to full-time use of the site. This is suggested by the fact that Room 3, or a possible room below it, was the first to be constructed, and that the living room, Room 4, was constructed next. This created a living room–storage room combination that would have provided the basic requirements for housing a small group. Additional storage rooms were added next, Room 2 followed by Room 7 and Room 5. Room 5 may have been intentionally built perpendicular to the other storage rooms to create the outlines of Room 6. To complete the room, only a southeast wall would have been needed. Alhough that wall was not encountered, the interior cross-wall and hearth suggest this was an enclosed living room. Exterior hearths were encircled by cobbles (features 7 and 20), while adobe-collared hearths were built inside structures. In the expansion scenario, Room 1 would have been constructed last of all, which would explain its better preservation and its position adjacent to the cluster of other rooms. By the time this room was built, in the expansion scenario, the other structures that were still functional would have been fully utilized, although not all were necessarily in use.

According to Crown's (1991) work at Pot Creek Pueblo, pueblo rooms were in use only for about 19 years. Thus, despite the remodeled hearth in each living room, the time span between the construction of Room 6 and Room 1 is likely to have been about 40 years, and the duration of the entire occupation something less than 60 years, making it possible that the structures at LA 110971 represent site growth. However, it is not clear whether the rooms were built (1) for periodic, seasonal use of the site during the growing season, with a new living room constructed as needed, or (2) to maintain continuous occupation of the site by a single group, with the living room rebuilt approximately every 20 years (Crown 1991), or (3) to accommodate a gradually increasing site population.

III. Artifacts

LA 110971 yielded a variety of artifacts, including chipped stone, ground stone, ceramics, animal bone, and plant remains. All artifacts were labeled according to test unit, room, and feature (Appendix 2).

Lithic Materials

Lithic raw material was easily available to people living in and near the Rio Grande basin. Rhyolite, chert, and basalt were available locally along the Pojoaque River. The vesicular volcanic materials used for ground stone tools were also available in the area, while the Jemez Mountains, 10–15 km

TABLE 5. Summary by raw material of chipped stone at LA 110971.

Material/ Provenience	Tools (No.)	Flakes (No.)	Debitage (No.)
Chert			
Rooms	2	150	131
Features	2	27	23
Test units	8	1,530	1,563
Total (n = 3,436)	**12 (0.3%)**	**1,707 (50%)**	**1,717 (50%)**
Basalt			
Rooms	0	40	20
Features	0	12	1
Test units	0	225	170
Total (n = 468)	**0**	**277 (59%)**	**191 (41%)**
Obsidian			
Rooms	1	4	6
Features	0	5	0
Test units	7	72	61
Total (n = 156)	**8 (5%)**	**81 (52%)**	**67 (43%)**

Provenience	Petrified wood (No.)	Quartzite (No.)
Rooms	6	1
Features	0	2
Test units	12	4
Total	**18**	**7**

distant, were a source of obsidian. A sandstone outcrop was located on the site of LA 110971, and the outcrop seems to have been used to reinforce the southwest wall of Room 3 and possibly to form part of the southwest wall of Room 4. Thinner fragments of basalt, schist, and other volcanic materials as well as sandstone were trimmed on the ends to form rectangular slabs, which were used to line hearths. Some of the stone was also made into manos and metates. Chert was available in the form of nodules in stream deposits washed off the slopes of the Sangre de Cristo Mountains. Distinctive chert such as that originating from the Pedernal volcanic plug, some 55 km to the north, was also available in the Rio Grande gravels as well as by direct procurement, and appears to have been present at the site, although it was not positively identified by chemical analysis.

Chipped Stone

Chipped stone at LA 110971 was divided into three material types, obsidian, basalt, and chert. Small quantities of petrified wood and quartzite were also noted. Categories of point, tool, flake, and debitage were identified for each material. Tool categories included scrapers, blades, and any other type of shaped tool. Flakes include all used and unused flakes, while debitage includes all other material (Table 5). A detailed list of chipped stone by excavation provenience is available from the authors.

Chert, in this case, refers to a group of cryptocrystalline lithic materials that includes a variety of distinguishable types of stone, such as petrified wood and agate. Chert was the most widely used material at the site, appearing in all six rooms. Basalt was found in five rooms and obsidian in four. This pattern probably reflects the relative effort involved in acquiring each material. In Room 1, three tools were recovered, while no tools were found in the other rooms. There were more lithic materials recorded from the fill of Room 1 than from the fill of the other excavated rooms. However, the density of chipped stone material was lower in this area than in other excavated areas when room contents and the fill over the rooms was considered (Fig. 9, Table 6). The larger quantity of chipped stone found in Room 1 suggests

FIG. 9. Chert distribution at LA 110971.

TABLE 6. Chipped stone by room at LA 110971.

	Chert			Basalt			Obsidian			Turquoise fragment
Provenience	**Tool**	**Flake**	**Deb.**	**Tool**	**Flake**	**Deb.**	**Tool**	**Flake**	**Deb.**	
Room 1	2	121	89	0	39	14	1	2	4	1
Room 2	0	13	11	0	3	0	0	1	0	0
Room 3	0	0	2	0	0	0	0	0	0	0
Room 4	0	12	10	0	0	1	0	0	0	0
Room 5	0	7	9	0	1	1	0	1	1	0
Room 6	0	10	16	0	1	4	0	0	1	0
Total, rooms	2	163	137	0	44	20	1	4	8	1
Features	12	135	105	0	72	6	0	45	0	0
Test units	7	893	900	0	143	109	5	42	37	1
Grand total (incl. rooms)	**21**	**1,191**	**1,142**	**0**	**259**	**135**	**6**	**91**	**45**	**2**

Note: Deb. = debitage.

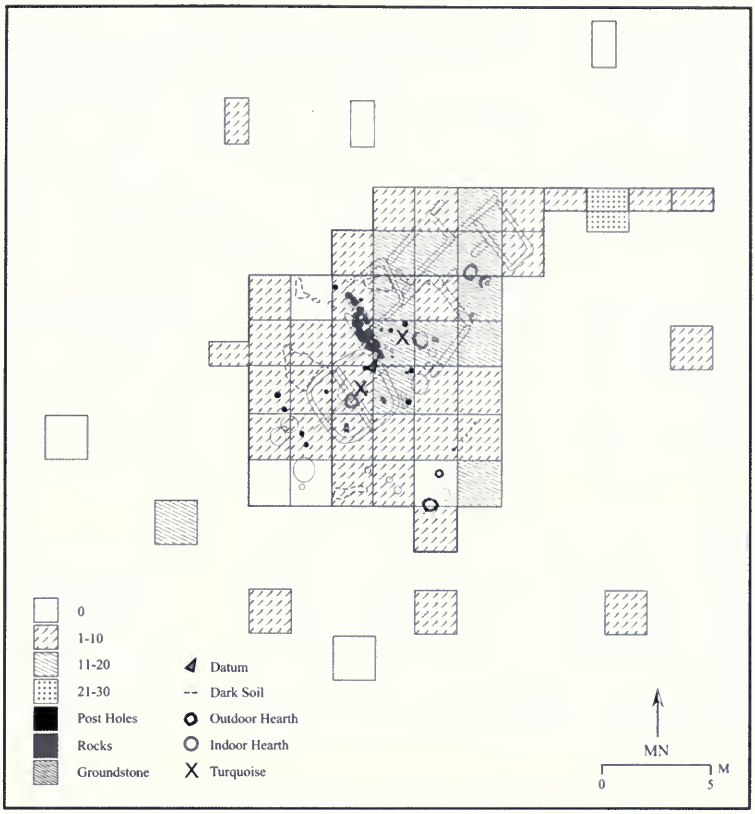

FIG. 10. Basalt distribution at LA 110971.

that it was the last room occupied at the site. The higher overall density of lithics for the badly eroded Rooms 4 and 6 may seem to contradict the premise that these rooms could have been scavenged both during and after abandonment (Diehl 1998). Relatively few chipped stone materials came from the room fill in Rooms 4 and 6 compared with Room 1. The greater density of chipped stone is in the fill above the rooms, suggesting that these rooms may have been used for trash disposal for some period of time. In contrast, the storage rooms, Rooms 3, 5, and 7, had a lower density of all lithic materials than the portion of the site where the habitations were located. Room 2, assumed to be a storage room because of its lack of a hearth, did have a number of artifacts in it approximating those in abandoned living rooms. These were present in the lowest levels excavated, where the soil was hard and rocky, forming angular lumps to make a highly uneven surface. Although this room could have been an anomalous living room—that is, one without a hearth—it could also have been leveled with midden, resulting in the distribution of artifacts that were found.

In addition to chipped stone found within the excavated rooms, a variety of chipped stone was recovered from the site surface. Analysis of the distribution of lithic materials by raw material type was undertaken in an effort to determine whether specific materials were associated with specific rooms. In addition, the distribution of lithic material had the potential to reveal concentrations of debitage that might be associated with trash disposal and midden formation. The largest quantity of chert was found in the vicinity of Room 4 and the two exterior hearths (see Fig. 9). Variability in the distribution of chipped stone across the site can be observed, with a greater quantity of chert spread eastward from the rooms and little chert to the north or west. Basalt was found in low densities across the entire site (Fig. 10). Fragments of obsidian were recovered in the majority of the units excavated at the site (Fig. 11). The highest density of obsidian was in the

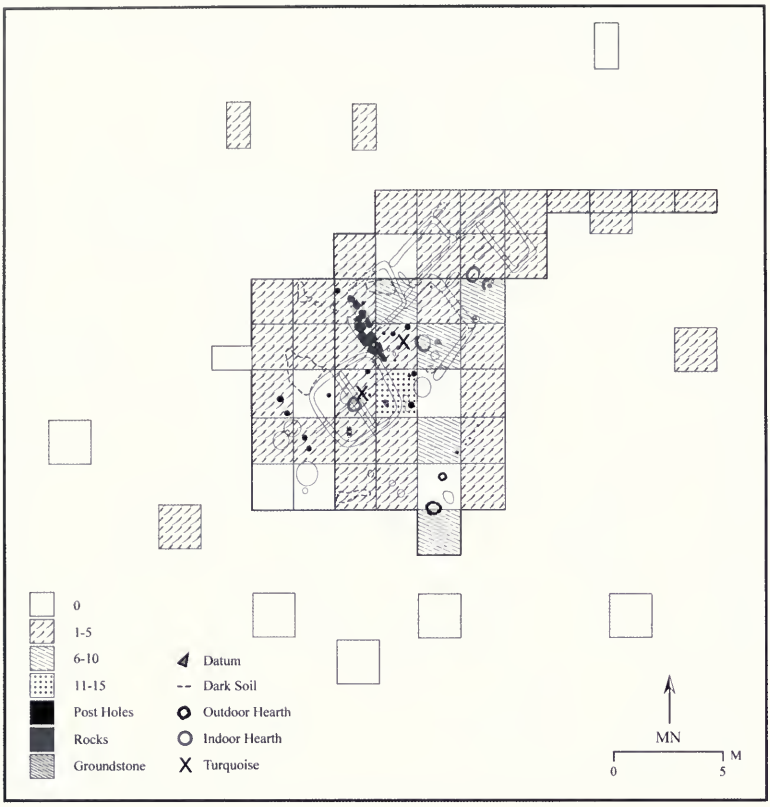

FIG. 11. Obsidian distribution at LA 110971.

fill above Room 1 where that room meets Room 4. The proportion of finished tools and used flakes to debitage does not clearly indicate whether obsidian arrived at the site already worked (see Table 6). The points recovered were generally small, side-notched or triangular points (Fig. 12). Some additional shaping may have produced tools from those flakes, while sharpening probably produced most of the debitage. However, flakes could have been brought to the site as an item of trade, or could have been produced at the source by residents who traveled to obtain it. The distribution of obsidian across the site is relatively even. There is no evidence that obsidian was worked in any specific room or part of the site. Tools and points recovered during fieldwork were found in the area of the structures for the most part.

The choice of chipped stone materials used for tools at LA 110971 is as likely to have been proportional to the distance traveled to procure raw material as any other interpretation. Chert could have come from cobbles washed into the Pojoaque River, close to the site. Basalt was available from the Pajarito Plateau, only a few kilometers from the site, while obsidian came from farther away, in the Jemez Mountains. Whether obsidian was obtained through trade or procured directly could not be determined from the sample we recovered.

Ground Stone

Most ground stone artifacts at LA 110971 were made of volcanic stone (basalt) or sandstone. Objects were divided into groups, including worked stone, hearthstone, small slabs, and burned fragments. Worked stone showed evidence of shaping on one or more areas, as well as a surface shaped by grinding. Hearthstones were generally slabs exhibiting extensive burning and/or smoke blackening, as well as use wear on one or more surfaces. Small slabs and burned fragments are items that could not be identified by function. Each of these objects had been subjected to some combination of grinding and use wear.

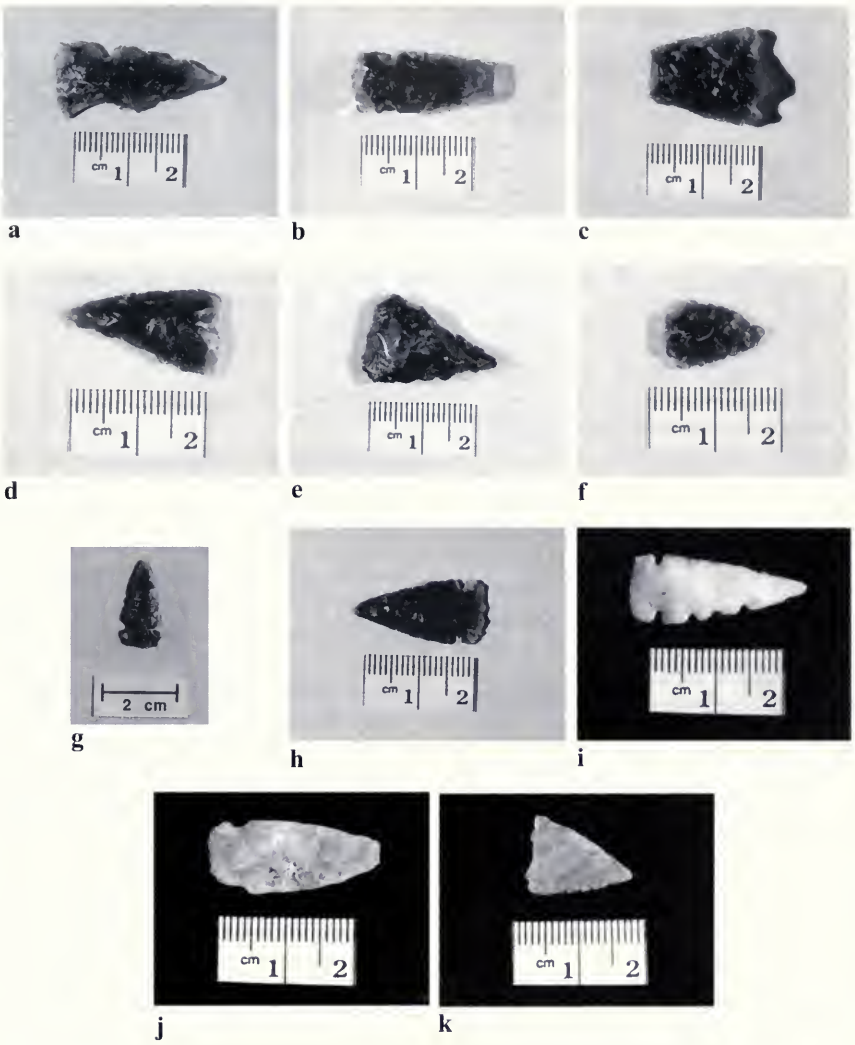

FIG. 12. Obsidian and chert points from LA 110971.

No whole grinding slabs or metates were recovered from the site, although a number of possible metate fragments were found, along with a number of hand stone, or mano, fragments (Table 7). The absence of whole, large grinding tools appears to be due to the reworking of broken tools into smaller ones, postoccupation scavenging at the site, and the general dearth of cultural materials at LA 110971. Any sizable ground stone tool would have been easily visible on the surface of the site, and perhaps scavenged. One of the few grinding tools recovered from the site was a grooved maul of vesicular basalt from N3 E1. The material suggests this tool could have been reworked from a metate fragment (Fig. 13).

Most ground stone recovered from LA 110971 was found in the area of the rooms, with little in the test units more distant from the center of the site (Fig. 14). Concentrations of ground stone were noted near the outdoor hearth (feature 7) in Room 4, and in an area overlapping Rooms 2 and 6. This probably demonstrates the close relationship between ground stone and household activities.

Other Stone Materials

Hammerstones found at LA 110971 were defined by battering on one or more surfaces. Ham-

TABLE 7. Summary of ground stone pieces at LA 110971.

Provenience	Slab and slab frag.	Mano and metate and frag.	Fragments with 1 or more ground surfaces
Features	28	15	3
Test units	113	38	12
Room 1	10	4	5
Room 2	3	1	1
Room 4	5	3	1
Room 5	1	0	0
Room 6	3	0	0

Note: There were no ground stone fragments in Room 3. Frag. = fragment.

merstones were made from quartzite, chert, and volcanic materials. The frequency of quartzite hammerstones suggests these were expedient tools, made of whatever materials came to hand, rather than illustrating a preference for particular materials (Table 8). The only evidence of specific selection of stone is the presence of turquoise at the site. In the northern Rio Grande, turquoise is most likely to have come from the Cerrillos Hills source, which is closest to LA 110971. Only two pieces of turquoise were found at LA 110971, a bead in the south quadrant of Room 1 and another small fragment of worked turquoise on the edge of Rooms 1 and 4 (Fig. 15).

In addition to turquoise, nine iron concretions were found (Table 9). These were probably recovered in the area surrounding the site, as they are not uncommon at other sites in the region and are a natural deposit within sandstone formations.

Ceramics

A total of 4,522 ceramic fragments were tabulated by location and type (Table 10). The locations were recorded by room, feature, or test unit. After excavation, the contents of each bag were separated into plain, corrugated, Black-on-white, or other ceramics. These in turn were divided into rim, body, bowl, or jar fragments. Pieces too small for identification are listed in the "too small" category. A complete list of all excavated ceramics by provenience is available from the authors.

FIG. 13. Grooved maul of vesicular basalt from LA 110971 that may have been reworked from a metate fragment.

Unpainted Ceramics

Plain Ware—Plain ceramics (n = 2,743) were the most numerous at LA 110971, accounting for 61% of all ceramics. These were undecorated coil-and-scrape vessels with a partially smoothed surface. These included gray ware sherds, which have no surface treatment beyond smoothing of the coils to create a flat surface. No boiling spalls were observed on the interior near the base of plain vessels (Nelson n.d.), although they may have been used in food preparation. Plain culinary ceramics were found across the site, with the highest concentration along the southeast margin of the site area, near the outdoor hearth, feature 7 (Fig. 16). During excavation, a layer of dark soil containing numerous artifacts was noted in this area. It appears that household debris may have been tossed or swept to the fringe of the living area. The dark soil area was not thick or mounded but appears to have been a layer of midden beginning at the southeast edge of the habitation area and thickening as one moved away from the structures.

A single whole plain ware vessel was recovered from test unit N2 W3. It was a miniature vessel approximately 2 cm tall and 1.3 cm in diameter (Fig. 17). About the size of a thimble, the vessel was located in N2 W3, a unit at the western edge of the site where no structures or features were identified.

Corrugated Ceramics—Corrugated ceramics were the second most numerous at the site, accounting for 34% of the ceramics recovered (n = 1,522). Corrugated ceramics were found in almost all proveniences at the site. Like the plain ware, the greatest concentration of corrugated ceramics was in units on the east and south sides of the site, outside the immediate living area (Fig. 18). These pieces have been identified as indented cor-

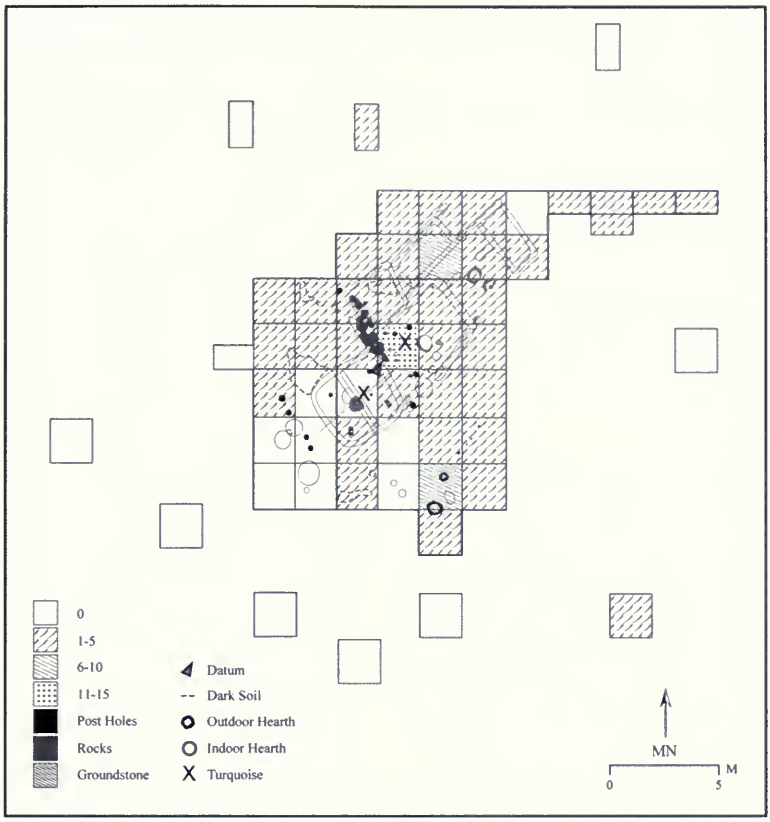

FIG. 14. Ground stone distribution at LA 110971.

rugated. This is a wide coiled type, with unsmeared indentations over the entire surface of the vessel (Nelson n.d).

At LA 110971, corrugated ceramics were made by coiled construction, with successive coils added on the outer edge of the previous one and then smoothed (Fig. 19). This technique results in a cross-section showing a slight overlap in the coils. When coils were not fully smoothed, the resulting surface is called "clapboard." The necks of some vessels display this technique, and the slight overlap in coiling can be detected in most corrugated sherds.

Detailed analysis of corrugated and decorated sherds from 87 proveniences at LA 110971, totaling 426 sherds (Cervantes n.d.), indicated that 89% of the corrugated sherds were indented corrugated. Clapboarding, smeared indented, and incised surface treatments together made up the remainder of the sherds examined. The indented corrugated sherds were examined for mica content. Fifty-two percent of the sherds examined were micaceous, that is, having mica in the paste.

Although most of the corrugated ceramics are

TABLE 8. Hammerstones at LA 110971.

Provenience	Quartzite	Chert	Volcanics
Room 1	2	3	1
Room 4	0	1	1
Feature 7	4	1	1
Test units	5	5	1
Total	**11**	**9**	**4**

Note: Feature 7 is a hearth filled with rock, including hammerstones and mano fragments.

FIG. 15. Turquoise bead fragment from Room 1.

Table 9. Concretions from LA 110971.

Provenience	No. of concretions	
Test unit		
N1 E1-1	2	Total of 3 from N1 E1
N1 E1–wall	1	
N3 E4-1	2	
N4 E8-3	1	
Rooms		
Rm 1-E-3	1	
Rm 5-2-1	1	
Surface cleaning	1	

believed to have been made in the northern Rio Grande region, the technique of exterior applied coils is more similar to that used in the Colorado Plateau region than to the interior application of coils used to make ceramics locally (Blinman and Price 1998). The method of construction of these ceramics provides another clue to the dates of occupation at the site, since over time, construction of utility vessels shifted toward the interior-coiled, Rio Grande technique. The assemblage from LA 110971 thus supports a relatively early date of occupation.

Painted Ceramics

Five percent (n = 233) of the ceramics recovered from LA 110971 were decorated with black paint on a smoothed and slipped surface. Most of the sherds that could be clearly identified were found to be Kwahe'e Black-on-white, though a very small number of sherds (n = 3) could represent an earlier type, Red Mesa Black-on-white. A few other decorated types were found, including seven sherds of White Mountain Redware (Carlson 1970) and six sherds of Biscuit ware. A single sherd from a bowl that was painted in red over white slip on the interior was also recovered from the site.

Red Mesa Black-on-white was among the earliest painted ceramic types found in the northern Rio Grande region (Wiseman and Olinger 1991). The Red Mesa style is a continuation and elaboration of the Kana'a Black-on-white style and is named after a similar type found in the Chaco area. Fine lines, commonly with ticks or rick-rack, are combined in panels or bands with filler triangles that may or may not be ticked or flagged. Other design elements include interlocking scrolls. Bowls are decorated on the interior and rim rather than on the bottom (Lucius and Breternitz 1992). This type has been dated to the period from A.D. 850 to 1050 (Breternitz 1966).

The presence of Red Mesa Black-on-white would be consistent with the earlier archaeomagnetic date and the presence of pithouses at the site. However, Red Mesa Black-on-white is usually associated with neck-banded and plain gray wares (Skinner et al. 1980:14). At LA 110971, plain gray wares, identified as culinary ware, some with neck banding, were found, but most of the ceramics were corrugated. In examining the decorated ceramics, only three sherds appeared to be possible fragments of Red Mesa. Each of these has fine paste fired white, with a gray core. One sherd from test unit N4 E2 is undecorated, while two pieces from S3 W2 are decorated with bands filled with thin parallel lines of hatching (Fig. 20a,b).

Kwahe'e Black-on-White—Kwahe'e Black-on-white was first described from LA 116 and was

Table 10. Ceramics from LA 110971.

Provenience	Plain	Corrugated	Painted	Other
Room 1	109	68	9	3
Room 2	21	58	2	0
Room 3	2	2	0	0
Room 4	3	4	1	0
Room 5	6	5	1	0
Room 6	22	27	0	0
Total, rooms	**163**	**164**	**13**	**3**
Room features	1	3	0	0
Non-room features	36	20	2	0
Test units	2,543	1,339	217	21
Site total	**2,743 (61%)**	**1,526 (34%)**	**232 (5%)**	**24 (0.005%)**

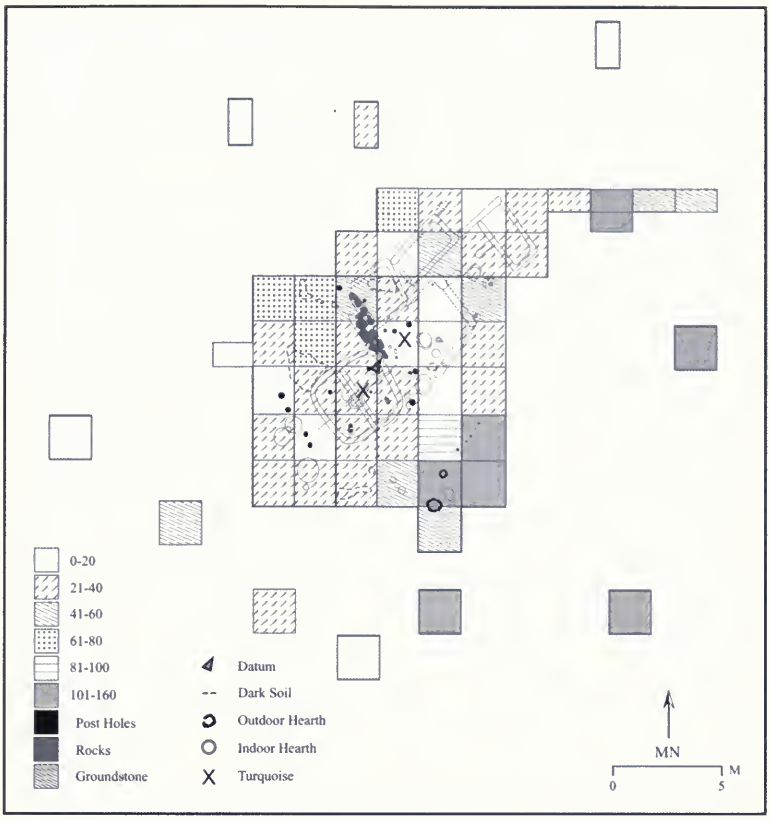

FIG. 16. Culinary ceramic distribution at LA 110971.

named by H. P. Mera (1935:5). This type is made of hard grayish brown clay with sherd temper. Made into vessels with coil and scrape construction, surfaces are self-slipped or unslipped. Sherds indicate a predominance of bowl forms with a straight or "self" rim. The white to grayish colored surface was painted with black mineral paint. Design elements include heavily drawn lines and solid elements, such as pendant triangles and hatching (cf. Mera 1935:PL. III) (Fig. 20c–w).

Of the decorated ceramics at the site (n = 256), 90% were Kwahe'e Black-on-white. In some cases coiling was still visible on the surface of Kwahe'e vessels. Vessel walls were thin and strong, well fired for open-fired vessels. Some fire clouds could be observed, but no sooting was observed on the sherds (Nelson n.d.). Kwahe'e is considered a Pueblo II ceramic type and has been dated to A.D. 1115–1200 (Breternitz 1966:81; Hawley 1950). This correlates poorly with the only archaeomagnetic date from the site, for which date ranges encompass A.D. 945–1040. The presence of Kwahe'e Black-on-white ceramics, identified as a twelfth century type, along with corrugated pottery, also thought to be characteristic of the twelfth century or later, could indicate that LA 110971 was in use until after A.D. 1100. Alternatively, these data suggest that both corrugated and Kwahe'e ceramics were being made in the northern Rio Grande somewhat earlier than has been estimated.

White Mountain Redware—Seven sherds of Black-on-red painted pottery were recovered at LA 110971. All appear to be White Mountain Redware, either Puerco or Wingate Black-on-

FIG. 17. Miniature vessel of culinary ware.

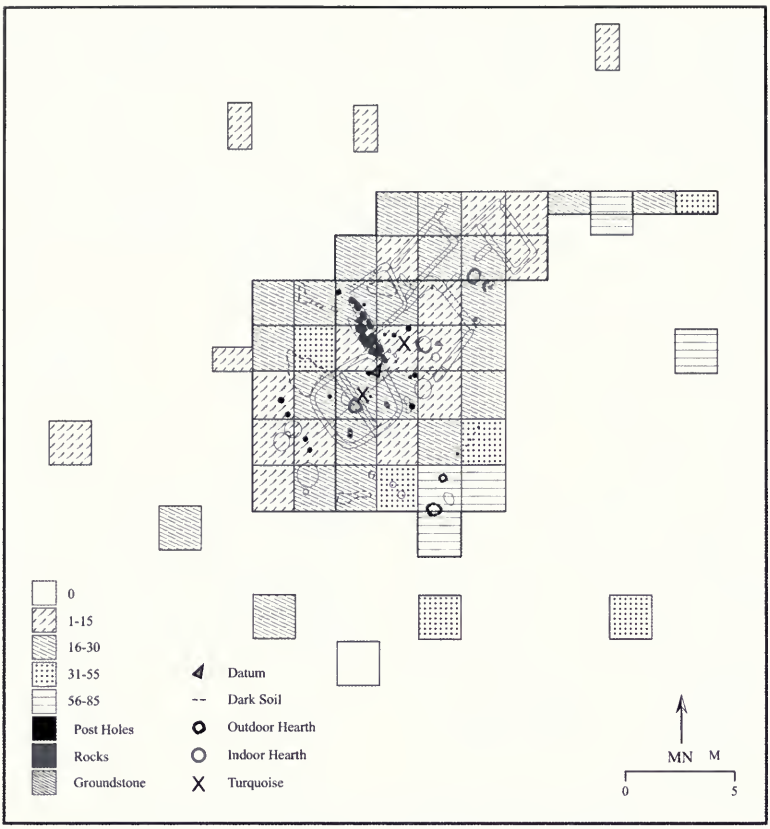

FIG. 18. Corrugated ceramic distribution at LA 110971.

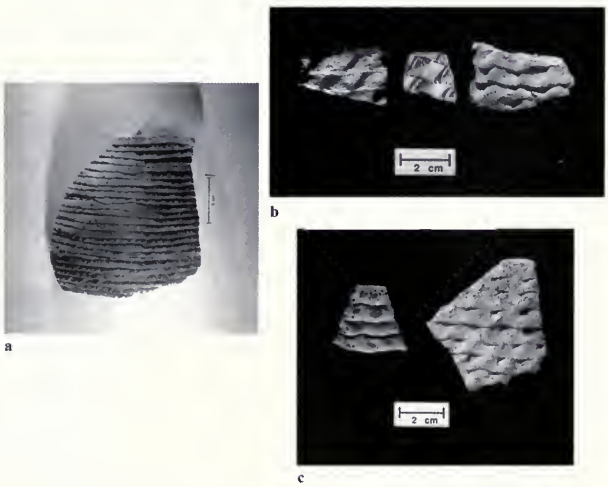

FIG. 19. Corrugated ceramics from LA 110971: **a–c,** indented corrugated, showing overlapping coils.

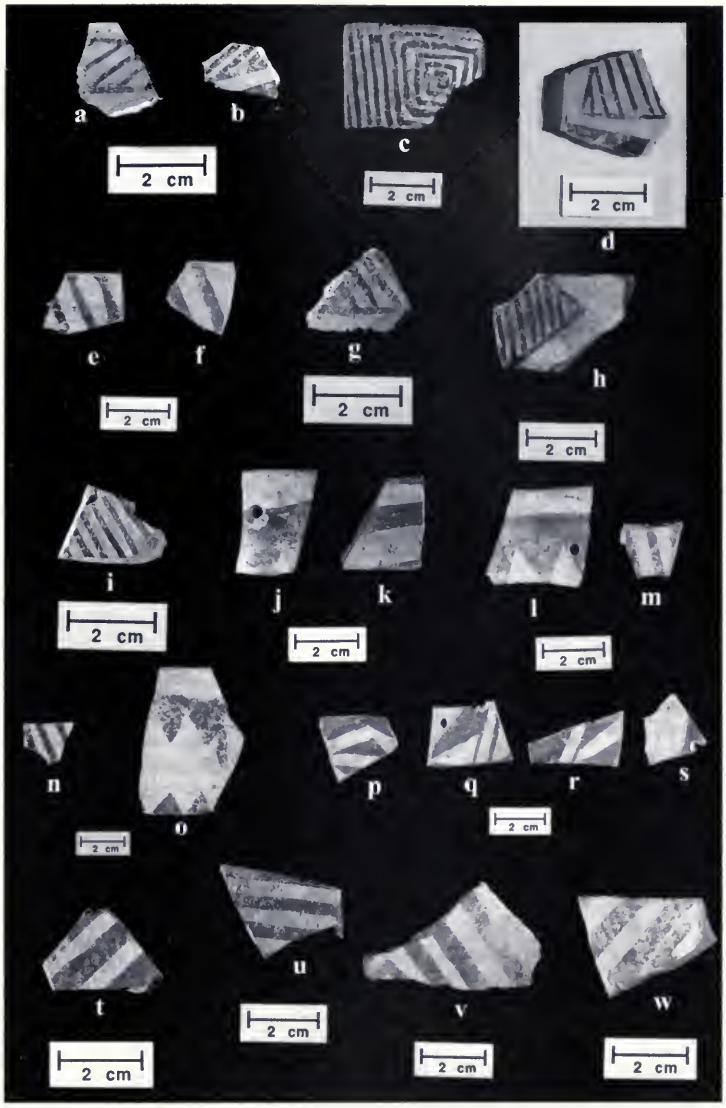

FIG. 20. Sherds of Black-on-white types from LA 110971: **a–b,** Red Mesa Black-on-white; **c–w,** Kwahe'e Black-on-white.

red. These are the two earliest types of White Mountain Redware. Puerco Black-on-red was produced from A.D. 1000 to A.D. 1200, and Wingate Black-on-red from A.D. 1050 to A.D. 1200 (Triadan 1997:14). Both types were made of a relatively fine pale-colored paste (white, buff, or gray), with bowl forms most common (Fig. 21a–c). Bowl interiors were covered with red slip and then black designs, which were sometimes outlined in white (Carlson 1970; Triadan 1997).

The frequency of White Mountain Redwares and white wares at LA 110971 is similar to the frequency of these wares at the nearby site of LA 835. At LA 835, 92% of decorated sherds were white wares and 8% were red wares, while at LA 110971, of the 252 decorated sherds, 91% were white wares and 2% were White Mountain Redwares. LA 835 may have been established before LA 110971 was in use, and is likely to have stayed in use over a longer period of time. LA835 was a multicomponent site, while LA 110971 had relatively limited reuse, including only construction and two rebuildings or additions.

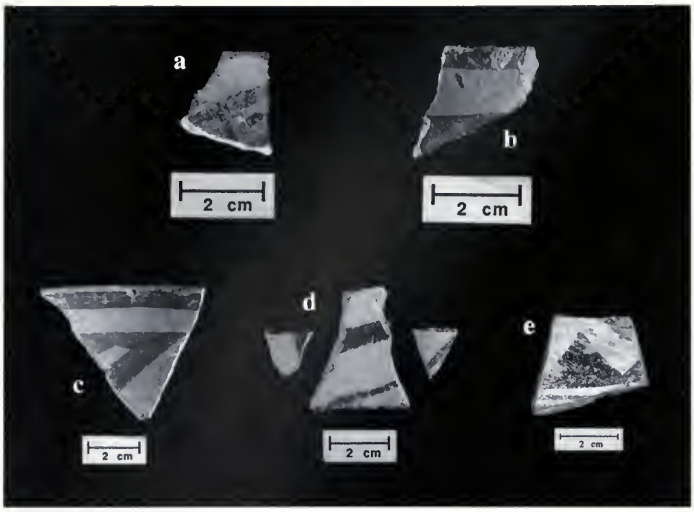

FIG. 21. Other decorated ceramics from LA 110971.

Biscuit Ware—Six sherds of Biscuit ware were recovered from LA 110971. Biscuit ware is a later ceramic type than any of those discussed thus far. Described among the artifacts from Pecos Pueblo, Biscuit ware is characterized by a powdery or chalky surface similar to green ware or biscuit in contemporary ceramic manufacture (Kidder and Amsden 1931:73). Biscuit ware tends to be thicker than many other ceramics of the northern Rio Grande. The paste is gray, very fine and even, with a fine pumice temper. Decoration on Biscuit ware consisted of decoration in black carbon paint on a smoothed, slipped or unslipped surface, usually the interior of a bowl. Biscuit A, the earliest type, lacked decoration on the exterior of the vessel, and this is the variety present at LA 110971 (Fig. 21d).

First made around A.D. 1350 to 1360 (Wendorf 1953; Schaafsma 1995), the Biscuit ware sherds found at LA 110971 probably postdate the use of the excavated structures by a century or more. The presence of this ceramic type at the site is best attributed to a postabandonment visit. Such a visit may have been to scavenge useable objects from the site, such as metates, or to salvage timbers that could be used elsewhere. Alternatively, the site could have been used as a temporary camp or shelter. The Biscuit ware sherds are few in number, however, and do not suggest repeated use.

TABLE 11. Sherds identified as "Other" at LA 110971

Unit	Bag No.	White Mountain red ware	Reddish paste		Crenellated utility
			Utility	Biscuit	
N1 E8-1	2	1	1	—	—
N1 W3-1	2	—	—	2	—
N2 E3-1	5	—	—	—	3
N2 W2-1	2	1	—	—	—
N4 E6-2	8	—	1	—	—
S1 E1-1	2	1	—	—	—
S1 E2-1	2	1	—	—	—
S2 E3-2	4	*	—	—	—
S3 E3-1	2	1	—	—	—
S1 W1-1	2	—	1	—	—
S1 W2-1	2	1	—	—	—
S1 W2-1	5	1	—	—	—
S2 W3-1	2	—	—	1	—
S4 W5-2	5	—	—	3	—
Rm 1—S-II	11	—	3	—	—
Total		**7**	**6**	**6**	**3**

* The collection also includes one sherd from a bowl decorated on the interior with red paint over white slip.

Other Ceramics

Table 11 indicates the provenience of distinctive ceramics recovered in small amounts from LA 110971. White Mountain Redware and Biscuit ware have been discussed. Of the others, the most distinctive type is represented by a single sherd of a bowl that was slipped white on the interior and painted with red triangles (Fig. 21e).

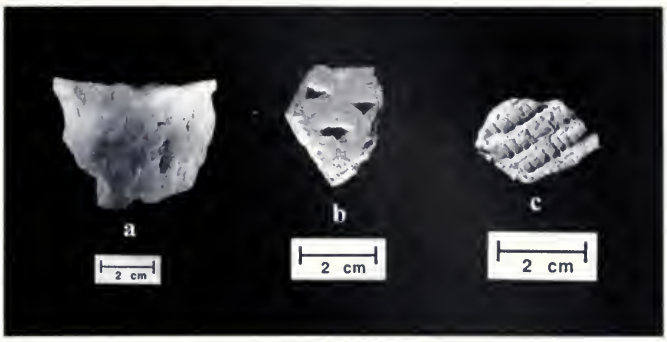

FIG. 22. Corrugated sherds from LA 110971, including some unusual varieties.

The exterior of the bowl appears to have been unslipped, though well smoothed.

Six fragments of a utility ware with a sandy, reddish paste were also identified (Fig. 22a). This appeared distinctive, though it may include sherds that were fire-reddened after use, rather than sherds that originally were made of a paste that fired red. Another vessel neck fragment was marked with fingernail indentations (Fig. 22b).

One sherd from test unit N3 E3 appeared to be from a Kwahe'e Black-on-white bowl. The exterior, however, is basketry-impressed (Fig. 22c).

Ceramic Pipes—The remains of three straight clay tube pipes were recovered at LA 110971 (Fig. 23). One fragmentary pipe was in test unit N3 E1, the surface unit excavated over Room 2; a whole pipe also came from Room 2. Four small fragments of an unusual pipe with a rectangular stem (when seen in cross-section) were found in test unit N2 E3. The pipe would have appeared much like a long rectangular bead, with notches along each long edge.

FIG. 23. Clay pipes at LA 110971; one is fragmentary.

Faunal and Macrobotanical Remains

Very few faunal remains were recovered from LA 110971 (Table 12). Room 1 and three test units yielded fragments of pocket gopher, mouse, or other small rodent likely to have burrowed into the site after abandonment and not related to subsistence. A vertebra and rib of a medium mammal probably represent a small deer. The two other fragments are of shell, probably freshwater mussel from the nearby Pojoaque River. One fragment of eggshell, probably from a turkey egg, was found as well.

A very small number of macrobotanical fragments were recovered (Table 13), including two fragments of corncob, two piñon nuts, and a nut or large seed. The corncobs are consistent with use of the site for seasonal cultivation of corn. The pinon and other nut are characteristic of use of the site during the fall, when nuts ripen, although it is also possible the piñon nuts fell from trees in the immediate vicinity of the site and are later inclusions.

Because of time and budget constraints, it was

TABLE 12. Fauna from LA 110971.

Excavation unit	No. of fragments	Comment
Room 1	1	Rodent skull fragment with upper incisors
N1 E2-2	2	1 rib, 1 vertebra, medium mammal
N2 W1	1	Mussel shell fragment
N3 W1-2	1	Eggshell fragment
N4 E7 N1/2-5	1	Rodent scapula
N4 E8 N1/2-3	1	Rodent scapula
S1 W1-1	2	1 rodent skull fragment, 1 mussel shell fragment

TABLE 13. Macrobotanical remains from LA 110971.

Excavation unit	No. of fragments	Comments
N2 W2-2	1	Large seed or nut
N2 E2-2	1	Corncob fragment
S3 W3-0	1	Piñon nut
S4 E2-1	1	Piñon nut
Room 1, W-III	1	Corncob fragment

not possible to analyze all the flotation samples during the excavation, although some samples have been processed and others are scheduled for processing. Flotation samples from the hearth proveniences—interior room hearth features 106, 403, 601, and 602, along with exterior hearth features 7 and 20—were dry-screened through 1-mm mesh. This test yielded no additional macrobotanical or faunal remains. Although the contents of the features included ash and soil, the hearths may have remained open long after the site was abandoned. Wind and rain action and disturbances by small animals may explain the lack of contents in these features.

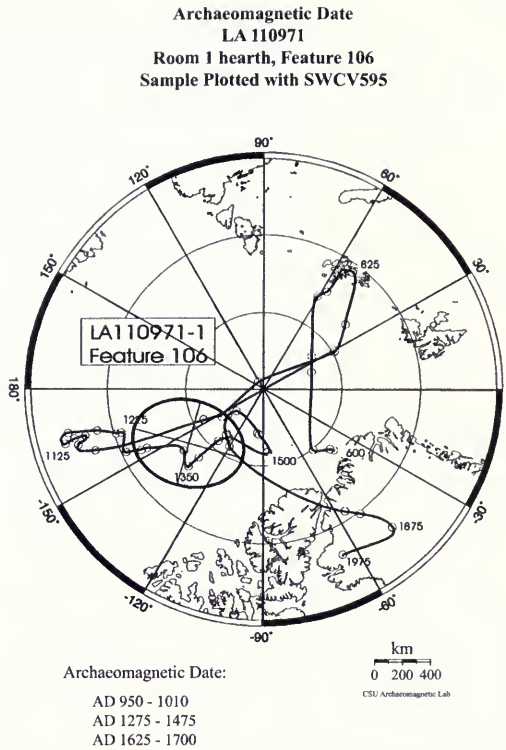

FIG. 24. Archaeomagnetic date from LA 110971.

IV. Chronology, Seasonality, and Aggregation

LA 110971 proved to be a different from what was initially anticipated. Rather than being a homestead of the late fourteenth century, as the Biscuit ware sherds on the surface suggested, this site was occupied around A.D. 1100. We were interested in the chronological position of LA 110971, the activities that were carried out there, and the role the site may have played in changing settlement patterns in the northern Rio Grande region.

Site Chronology

Chronometric Dating

During the excavation of LA 110971, a number of samples appropriate for chronometric dating were collected. Samples of wood for tree-ring dating were collected, as were charcoal samples for possible carbon-14 dating. Three samples were taken for archaeomagnetic dating. These samples came from the hearths inside each of the living rooms. Feature 106 was the hearth within Room 1. Feature 408 was inside Room 4, and feature 601 was the later of two hearths in Room 6. The earlier hearth in Room 6, feature 602, was only partially preserved and did not include sufficient burned material for archaeomagnetic sampling.

The tree-ring samples and the carbon samples are stored with the rest of the collections from the site. The archaeomagnetic samples from the three hearth features were processed, although only feature 106 produced a date (Fig. 24). Archaeomagnetic dating records the last heating of a burned clay or adobe feature. Thus the dates derived from archaeomagnetic testing are expected to indicate the final use of the feature that was heated, in this case hearths. When a fire burns down an entire structure, for example, the adobe used to construct the structure can be dated because it has been burned. Rather than indicating when the structure was built, archaeomagnetic dating suggests the date of the final use or abandonment of the feature tested.

The oval of confidence for the sample from fea-

ture 106 can be dated by reference to either of two calibration curves. Date ranges of A.D. 950–1010, A.D. 1275–1475, and A.D. 1625–1700 are possible using the SWCV595 calibration curve (LaBelle and Eighmy 1997). These were used to plot the date from feature 106. Date ranges of A.D. 945–1040, A.D. 1224–1290, and A.D. 1330–1400 are possible using the Wolfman curve (Cox and Blinman 1999; Blinman, pers. commun., 2001). In evaluating the sample from LA 110971, the range A.D. 1625–1700 is not relevant, because of the ceramics, architecture, and absence of European goods at the site. The thirteenth and fourteenth century alternatives are unlikely because of the dominance of Kwahe'e Black-on-white rather than either Santa Fe Black-on-white or Biscuit wares. This leaves the earlier interpretations of either A.D. 950–1010 or A.D. 945–1040, depending on which curve is used. The pottery assemblage from LA 110971, however, suggests that the occupation falls principally within the twelfth century and thus does not correlate with any of the archaeomagnetic date ranges. Subsequent adjustments in calibration of the master curve used for archaeomagnetic dating (LaBelle and Eighmy 1997) may result in adjustment of the dates in the future. Such an adjustment might conform better to the relative date of the site as derived from ceramics.

It is also possible that the archaeomagnetic date from feature 106 does not represent the final use of the site. The initial interpretation of feature 106 was that it was the hearth within the last structure to be used at LA 110971 because the room was in a better state of preservation than the other structures excavated at the site. If this is not correct, it is possible that the hearths that could not be dated were actually later and more in keeping with the date established by the ceramics present at the site. Further, the Developmental period is a lengthy time unit in the northern Rio Grande region that is in need of further subdivision, which will require more chronometric dates and closer study of ceramics (Boyer and Lakatos 2000:61–72).

Relative Dating

Ceramics—Though few in number, most of the mineral paint–decorated ceramics recovered from LA 110971 have been identified as Kwahe'e Black-on-white. Kwahe'e is considered an identifier of the Late Developmental period in the northern Rio Grande region, sometimes called the Kwahe'e Phase, and dated to approximately A.D. 1115–1200 (Breternitz 1966; Skinner et al.1980: 14). While some of the Black-on-white decorated ceramics at the site could have been Red Mesa Black-on-white, which is dated to A.D. 850–1050, the design elements at LA 110971 indicate otherwise. All of the Black-on-white ceramics at LA 110971 were painted with mineral paint; thus they could not be the later Santa Fe Black-on-white ceramics, which were introduced to the region around A.D. 1175. Although the archaeomagnetic date suggests that the final occupation ended before A.D. 1040, during the middle Pueblo II or the Developmental period, the predominance of Kwahe'e Black-on-white ceramics suggests that occupation of the site continued beyond that date and could even have extended through A.D. 1150.

Architecture—Architecture at LA 110971 included three shallow circular structures and seven rectangular rooms with adobe footings. It is presumed, based on the volume of construction debris, that the circular structures had a jacal, or wattle-and-daub, superstructure over an adobe base. The rectangular structures, in contrast, would have been completely constructed of adobe. Other sites in the region with pit houses are generally of an earlier date, although Cordell (1979:43–44) and Dickson (1979) both note that pit houses were constructed and used through the Developmental period in the northern Rio Grande.

Examples of sites having pit houses include the Sedillo site, LA 3122, in Albuquerque, where ten pit houses and six subsurface storage cists were excavated. Although measurements were not given, section drawings of three pit houses suggest that those at the Sedillo site were 1 to 2 feet deep (Skinner 1965). Ceramics on the floors of the Sedillo site pithouses included Kwahe'e and sherds of Red Mesa Black-on-white, but also a wide variety of ceramic types not present at LA 110971. Four pit houses were also excavated at the Denison site, approximately 8 miles southwest of Albuquerque. As at the Sedillo site, seven different decorated ceramic types were present at the site, including Red Mesa, but not Kwahe'e (Vivian and Clendenen 1965).

The two latest pit houses at the Denison site were estimated as dating to A.D. 930–1030 (Vivian and Clendenen 1965). These pit houses were between 30 cm and 1 m deep. One shallow pit house similar in form to those at LA 110971 has been excavated near Zia Pueblo, but it is estimat-

ed to date to the late Basketmaker III–Pueblo I period, or prior to A.D. 900 (Vytlacil and Brody 1958:175–177). Four of the structures at the Sedillo site (numbers 4, 7, 8, and 10) and two structures at the Denison site (structures 1 and 2) were estimated to date to A.D. 930–1030 (Vivian and Clendenen 1965), comparable to the archaeomagnetic dates from LA 110971 but differing from the site date estimated by ceramics. Further, the pit rooms at LA 110971 were all shallow, less than 30 cm deep in the center.

Aboveground rooms like those found at LA 110971 begin to be found in association with pit house sites in the Albuquerque area in the period A.D. 875–930 (cf. Peckham 1954:41–51) and continue through the Early Developmental period (A.D. 900–1100), which included pit houses with an aboveground structure, such as LA 6174, and into the Late Developmental period (A.D. 1100–1200), such as at LA 10614. The absence of ventilators in the structures at LA 110971 suggests these were not pit houses as found during earlier periods. Rather, the similarities between Albuquerque pit structures and those at LA 110971 are very general, such as diameter, four-post roof support, ash pits, adobe-rimmed hearths, and an easterly oriented door.

Structures with the greatest similarity to those at LA110971 are the shallow subrectangular pit houses at LA835, located nearby in Pojoaque and suggested by Ellis (1975) to have been the winter camp, permanent base, or central place for the occupants of LA 835. Structure 1 at LA 835 is a subrectangular pit house with an adobe-collared central hearth. Structure 2 at LA 835 is different in shape from the structures at LA 110971 but had corner posts, as did the structures at LA 110971.

The greatest difference between LA 110971 and the other sites mentioned seems to be in the variability of the ceramic assemblage and the presence of rectangular aboveground rooms. A high level of variability in decorated ceramics such as that recorded at LA 835 has been suggested as characteristic of the pre-A.D. 1100 portion of the Developmental period (Lakatos, pers. commun. 1999; Boyer and Lakatos 2000; Wilson 2000:99–100). Further, Kwahe'e Black-on-white ceramics are estimated to date to A.D. 1115–1200. Thus, when dated by ceramic similarities, LA 110971 falls into the post-A.D. 1100 Kwahe'e phase of the Developmental period, based on both the very small range of types found at the site and the predominance of Kwahe'e decorated sherds in association with corrugated utility wares (cf. Mera 1935:Pl. III). The occupation probably ended before A.D. 1175, based on the absence of Santa Fe Black-on-white ceramics at the site. It is also possible that a portion of the occupation dated to before A.D. 1100, based on the possible presence of a few sherds of Red Mesa Black-on-white at LA 110971.

Architecturally, most Late Developmental or Kwahe'e phase settlements consist of aboveground rectangular rooms used for both living and storage, and kivas. At LA 110971, the aboveground rooms show no evidence of having been used as living areas and were apparently used only for storage. These rectangular rooms had no identifiable floors and no recognizable interior features, characteristics consistent with use for storage. The three subrectangular shallow-pit structures were clearly habitations, as they included interior features such as hearths, ash or baking pits, post holes, and other features. In two of the three living rooms excavated, a wall had been built to bisect the structure, further subdividing the living space. The combination of form, features, and ceramic assemblage suggests the site dates from the eleventh century to the early twelfth century (A.D. 1050–1150), during the Developmental period.

Seasonality

The LA 110971 site appears to have been an agricultural hamlet, part of a larger system of habitation sites and outlying special-purpose sites. LA 110971 was apparently utilized by a group that built and remodeled three shallow pit structures one after the other, creating Rooms 1, 4, and 6. The adjacent rectangular, aboveground structures were apparently used for storage. Aspects of site use that have not yet been determined include whether the occupation of LA 110971 was continuous, with rebuilding of one pit structure adjacent to another, as suggested by the lack of overlap among the structures. The site could have been completely abandoned for a time between the construction of one living room and the next as long as some portion of the structures remained visible. Whether the additional rooms were built to replace living quarters no longer considered habitable or to accommodate a growing group size also remains to be determined.

The location of the site, near water and on alluvial land, is typical of the Developmental period

(Cordell 1979:44). LA 110971 is situated on a low rise near the Pojoaque River at 1750 m above sea level, overlooking level land that extends to the river bank. The site would have favored occupation during spring and summer, when crops were in the ground. In addition, the inhabitants could have fished in the nearby Pojoaque River if their occupation took place during the growing season. Lacking at the site are facilities such as pottery-making areas or kilns, and a mealing area. There was also a marked absence of animal bone, although the deposits were shallow, which may have contributed to disappearance of bone. In sum, the evidence suggests that the site may have been seasonally used, but it is not conclusive.

Seasonal use of LA 110971 is supported by Ellis's suggestion that while the people of this period were spread along the Tesuque River Valley and its tributaries, including the Pojoaque, they were united by what she called a "parent village," LA 835 (Ellis 1975:39–41). LA 835, suggested to have been in use from the 800s through A.D. 1200 (Wiseman and Olinger 1991), is located less than 5 km to the north of LA 110971. Therefore, LA 110971 could have been occupied during the later 1000s and into the 1100s during the growing season. Construction of adobe-base jacal-walled living structures was supplemented over time by rectangular adobe structures used for storage. During the winter, the group or family occupying LA 110971 may have lived at LA 835, as suggested by Ellis, although we cannot be sure.

The rooms at LA 110971 show evidence of substantial construction and repeated use. All living rooms have collared hearths that were remodeled at least once, and in two of the three rooms a central cross-wall was added at some point. The renewal of facilities suggests sustained use, as does subdividing a living room. Although Ellis has suggested that the inhabitants of this area may have used LA 835 as a winter home (Ellis 1975), it is possible that the people who lived at LA 110971 stayed there year round, taking advantage of the resources that changed with the seasons. LA 835 is nearby and could easily have been visited for group activities such as hunting, collecting, trade, socializing, or ritual activity. The great kiva at LA 835 may have accommodated ritual activities incorporating visitors.

Whether LA 110971 was a seasonal occupation may eventually be established by analysis of pollen and flotation samples. The small quantity of faunal and macrobotanical remains recovered during excavation is not adequate to determine season of use. Further, if a kiva is identified at LA 110971, it will support the possibility of year-round occupation, because construction of a kiva is a project that requires time and cooperation of residents. Further, a kiva would help fill the ritual needs of the people living at the site. Additional testing at LA 110971 will be needed to address this aspect of seasonality.

LA 110971 and the Aggregation Process

From the start of our fieldwork at LA 110971, it was apparent that the site dated to an earlier period than was expected based on preliminary surface survey and testing. The site is not a fourteenth century village but was used by a family or multifamily group during the eleventh century and early twelfth century. Clear evidence of later occupation was absent. Careful inspection of the site surface and of the excavated artifacts yielded no glazed ceramics and only six sherds of Biscuit ware. This supports the conclusion that Biscuit ware at the site is probably from short visits to the site during a later period than the principal occupation. It is difficult to assess how extensive a later occupation of the site might have been, since there is little pottery present, and there was no evidence of the rooms having been reused based on their artifact contents.

The shift from the use of pit houses to aboveground rooms was well under way by A.D. 1050, when LA 110971 may first have been in use. Further, the site provides some hints about the pace of settlement aggregation that occurred over time and culminated in the large Pueblo villages of the protohistoric era. Settlement in the northern Rio Grande region at the beginning of the Developmental period seems to have alternated between summer pit houses near fields and winter pit houses closer to hunting and foraging territory. Over time, extended family groups dispersed among fields in the summer may have converged on a favorable winter location.

The layout of LA 835 supports its having developed gradually. Ellis describes the site as made up of 12 to 15 house units, each consisting of "between 10 and 20 contiguous rooms and associated kivas" (1975:41). Assuming the validity of Ellis's suggestion, LA 835 would be the first step toward aggregation of extended family units into larger sites, seasonal though such villages may have been. The presence of a great kiva at LA

835 also confirms the importance of large-scale activities to promote solidarity among the inhabitants of even the earliest aggregated settlements.

LA 110971 could have been one of the extended family seasonal hamlets or field houses that fed into LA 835 during the winter. In this case, the shift to aggregated villages took place as seasonal hamlets were used as a principal dwelling for fewer and fewer months each year. Between A.D. 1150, the latest date at which the site is likely to have been occupied, and about A.D. 1400, the practice of establishing hamlets such as LA 110971 would have ended, replaced by storage structures located at sites used year-round, construction of ever more ephemeral "field houses," and a shift toward clustered settlement across the region.

The alternative scenario, that LA 110971 represents a permanent, year-round settlement occupied from around A.D. 1000 to 1150, may show aggregation developing in a different way. It is clear that by the beginning of the fifteenth century, the people of the northern Rio Grande region lived in aggregated settlements, with ceramic firing areas and shrines, but rarely habitations, situated outside the large pueblos. Among the large sites, some are composed of long blocks of rooms with few ground-floor doors or gaps among structures, such as Poshu (LA 274) or Pecos Pueblo (LA 625), while others consist of groups of roomblocks that are not connected to one another, such as Cieneguilla (LA 16). The eventual form of the village may have more to do with how it was formed than its defensibility. Individual year-round occupations that grew over time, whether from exploitation of local resources, successful trade, or social alliances, may have become the nuclei for later large pueblos. The generations of rebuilding, remodeling, and expansion at later sites show that a favorable site location, especially with a permanent water supply, kept people in one locality. Thus, a site like LA 110971, beginning with a family or small group, could have planted the seed for a later aggregated site.

The partially aggregated neighboring site of LA 835 could have been a template for aggregation based on a different model starting from dispersed groups living in proximity to one another. If LA 835 began as a winter occupation by groups who had to leave their summer locality, it could have been a model for aggregation of numerous autonomous units. The reasons for aggregation would have been the same as those for developing a single large unit: secure water and resources, opportunities for trade, and social alliance. The difference would have been in the origin of the system overall. The social cohesion in an aggregated site that began as a single group may have been the lineage, while the basis for social cohesion in a site that began from many groups may have been sodality relations. The latter form may have been especially important in the northern Rio Grande during the Coalition and later periods when there was movement of people into the area from farther north and west. It is even possible that the development of aggregated villages from two different social perspectives could help explain the social organization of the descendant Pueblo people who are united both by lineage and by moiety relations, perhaps the legacy of aggregation in the northern Rio Grande.

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Appendix 1. Participants in the Field School

The following individuals participated in the Northern Illinois University Field school that excavated LA 110971 in the summer of 1997:

Directors: Winifred Creamer, Jonathan Haas

Crew Chief: Kit Nelson

Crew Members

M. Cullen Bailey
Elizabeth Castenson
Ingrid Klune
Jeanne Pepalis
Sam Poitevent
Leah Rein
Brad Williams

Volunteers

Beth Bagwell
James H. Duncan, Sr.
Mary Futrell

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